MEDICAL REPOSITORY,

FOR

MAY, JUNE AND JULY, 1803.

ARTICLE I.

A CASE *of very singular* NERVOUS AFFECTIONS, *supposed to have been occasioned by the* BITE *of a* TARANTULA.* *By Dr.* JOSEPH COMSTOCK, *of South-Kingston (R. I.) Addressed to Dr.* A. C. WILLEY, *of Block-Island, in a Letter dated January* 24, 1803.

IN the month of December, 1801, Nancy Hazard, aged 15 years, whose parents lived in North-Kingston, was on a visit upon the Island of Conanicut.† The weather in that month being remarkably warm, she went, in company with another young woman, to a stack, to procure some oat-straw to make some female attire for the head. While stooping down and culling the straws which lay on the ground, a large black spider, which she said she observed had very shining black eyes, ran on the back part of her hand, and, without her attempting to molest him, having heard, as she said, that it was good luck, soon ran off. She said it gave her a slight

* The Tarantula is the *Aranea Tarantula* of Linnæus, and not a Phalangium, which is quite a different genus. George Baglivi has composed an express treatise on the history, anatomy, bite and effects of the tarantula. It was published at Rome in 1695, and may be now found in the volume which contains his collected writings. This celebrated Italian testifies that the bites of the phalangiums and scorpions of Apulia bring on symptoms like those consequent upon the venom of the spider, and require to be mitigated in like manner by music and dancing. After a perusal of Baglivi's dissertation, the evidence he adduces seems so weak and inconclusive, that the disease would rather appear to be a species of hysteria, melancholia, or hypochondriasis, or some analogous affections, especially as the greater part of the patients are females. *Mulieres tamen quarum inter tarantatos pars magna est, morbum hunc frequentissimè simulant per symptomata eidem familiaria, &c.* (Baglivi *Dissertat. cap.* vii.) But even supposing this case to be mere *hysteria*, we think it sufficiently important and singular to deserve publication. EDIT.

† An island in Narraganset Bay, near Rhode-Island.

sensation, whilst on the back of her hand, like the prick of a pin, upon a particular part which she pointed out. The same afternoon she felt the hand and arm of that side to twitch involuntarily several times, and that night was taken with a pain in the same, which shifted into her stomach, and increased till the morning of the third day afterwards, when she went into fits.

If I recollect, she puked several times upon the second and third days.

A physician was called; but she not having mentioned the spider, and her complaints resembling hysteria, were treated as such by him. This information I received from her and the family. The medicines which he gave, they did not know; she was bled, however.

She not growing any better, Dr. Perry, then my co-partner in medical business, was called. From him I learned that in her case he discovered something very peculiar, and was led to consider it a case *sui generis*.

He observed that her fits resembled, in some measure, hysteria, but more nearly hysteric paroxysms combined with the St. Vitus's dance.

After premising a gentle cathartic, he gave her the tinct. castor, spt. C. C. and an opiate at night. By these it was thought some relief was afforded; but the fits returned the next day, and were very obstinate and distressing.

Being at the distance of twelve miles from her, he did not visit her again till five or six days afterwards. Her situation was not essentially altered: the fits continued to afflict her the greater or less part of every day. They were not accompanied with fever. To the former remedies he joined the oleum succini, with orders to increase the dose of the opiate.

The Doctor, after this visit, first mentioned to me an extraordinary increase of sensibility, which he observed in her feeling, and which constituted, afterwards, a prominent and very striking feature in her complaint.

There had no mention been made by her, as yet, respecting the spider; but that she had an inclination for music was judged by her movements with her hands and fingers, when in her fits, as if after a tune; and when music was introduced her motions corresponded; she beating with her hands and finger ends upon her breast, in imitation of dancing. And sometimes, when, from the violence of the spasms, she could not regulate her motions, and would strike too hard, it was common for some of the attendants to place their hand

upon that part of the thorax where the ends of her fingers struck, to prevent the harm. She appeared best pleased when her father's hand was placed for this purpose; and if another person ever so gently endeavoured to displace his hand, and put his own in its place, she would immediately push away the strange hand, and seek for her father's! This she did, although to every thing else insensible, and with her eyes closed.

This was not done by taking the different hands into her own, and discriminating them by their magnitude, softness or hardness; for this the violence of the spasm, with which she was universally affected, rendered her incapable of doing; but simply by touching with her finger ends, as the Doctor experienced in himself. The violence and long continuance of the paroxysms having induced debility, some tonic remedies were added to the above; after which she was removed home, appearing somewhat better, or having only, perhaps, a longer interval of ease.

The disorder, however, soon returned with increased violence; and the medicines, after repeated trials, and increased doses, not appearing to have any effect, were at length discontinued, from a conviction of both physicians and friends that they were of no utility. Music now became the substitute for medicine, and was absolutely necessary, it being the only thing which moderated the violent and distressing spasms with which she was the greatest part of the time afflicted.

It was the fortieth day of her illness when I first visited her. When I went into the room she was sitting in a chair, leaning her head upon one of her friends, and following, with motions of her hands, a tune sung by some young woman who appeared to attend for that purpose. The tune she followed with the greatest regularity and exactness. If it changed for an air more quick or slow, her motions exactly corresponded; if it stopped, her motion immediately ceased. Yet to all other sounds did she appear as insensible as matter inanimate.

Her muscles were continually affected with spasm during the paroxysms. Before the music began, or, if it ceased, the spasms were very violent and excruciating, affecting her muscles with convulsive motions. When the music commenced, it in a very great degree relaxed the spasmodic tension, and the convulsive motions were changed for the motion of her hands in following the tune. The tension remained, however, in her fingers, which, all the time of the fit, were

drawn apart as far as possible, and rendered stiff as sticks. She did not now, as she did afterwards, dance upon her feet.

After remaining in this situation about an hour the fit began to abate. She was now able to regulate the motions of her hands, and to speak, though indistinctly.

She was in this situation when I was desired to approach her, that I might witness something still more extraordinary than a disorder for which music was the only remedy yet found out.

Her eyes had not been open since I came into the room; and, to my surprise, without opening them, and by feeling only, she accurately told the colour of the different garments I had on!

This faculty she possessed in such an eminent degree as to be able to point out different colours upon one piece of cloth, cotton, linen or woollen, and to be able to discover different kinds of materials when wove into one piece, as woollen, silk and cotton. More exquisite still was this sensation: After feeling my hand some minutes with great attention, she would afterwards tell that things received from my hand belonged to me. This cost her more time and study than the other; and I observed that, in order to determine this, she put those substances on her cheek, as she had done my hand before them.

Did holding a substance in one's hand make a slight alteration in its surface, which her extreme sensibility of feeling could discover? And having before felt that hand, could she perceive the similarity? I was led so to conclude, or to leave the phenomena unaccounted for.

I was strengthened in this opinion by what further happened. I held a piece of money some time in my own hand, and then gave it to another person to hand to her. This appeared to puzzle her very much; and after feeling of it for some time with great attention, she accidentally let it drop, and then said she believed that it belonged to the person who passed it from me to her; but upon its being put into her hand again, she put it to her cheek, and determined that it was mine. Perhaps it will be said that by my own reasoning she ought to have adjudged it to the person who last held it: but I must remark that I held the piece longer than the other person, who, as he passed it from me to her, only slightly touched it. If, therefore, holding it in one's hand altered the surface in a slight degree, it was probably altered most by my hand. Her putting it on her cheek was probably owing to the sense of feeling being more acute there than in her fingers, she

having been accustomed to use her fingers when in health. I have observed persons to do the same when they wished to perceive a slight degree of warmth in any body, or the smoothness or softness of any material.

I should not relate things so much surpassing common credibility as those I have related, and am hereafter, in this account, to relate, let my senses confirm them ever so unequivocally, out of sight of credible witnesses. But these, and the other circumstances which I shall mention, were all observed in open day, and in the presence of persons whose testimony is not to be doubted.

All this time she was partly in a fit. She soon after came entirely out of it; was rational as when in health; and all this magic sensibility vanished; she remembering nothing of what had happened during the paroxysm.

I was now led to consider her disorder a real *tarantismus;* and, upon inquiry, she related the history of the spider, and the affection of her arm the same day, as above related. The partiality which she had formerly shown, when in her fits, for her father, had now begun to abate, and even to be changed to an aversion; but she still evinced a peculiar regard for her relations more remote, as cousins, &c.

Upon the back of the hand of one of those she chose to play with her fingers in following the music; and I now made the same experiment which Dr. Perry had done early in her illness. I put my hand, at the instant that both her's were lifted up, in the place of her relation's. The consequence was as before: immediately upon the ends of her fingers touching it, she endeavoured to remove it, and felt for the other!

I did not see her again until the twelfth week from the commencement of her illness, but received frequent intelligence from her. Her fits returned at unequal periods during that time. Sometimes these intervals were protracted two or three days, in which she enjoyed good health, which was usually the case in the absence of the fits; some irregularity of the menstrua only excepted.

The reports spread about the country of her strange illness, and surprising faculty of distinguishing colours by the touch, which some vulgarly attributed to witchcraft, drew together a great many people to see her. The throng of spectators, and the extreme attention she was obliged to make use of in order to distinguish colours, appearing to fatigue her, her parents were advised to prevent her being put upon the trial,

which was accordingly done. I did not now put her upon any trial of this kind; but the sensation appeared to continue as acute as ever; for she readily distinguished her relations by the touch; to all of whom she now manifested as great an aversion as she had before shown fondness. None of them were able to touch her, when in her fits, without aggravating every symptom, and bringing on the most violent spasms. And it was even said she could ill bear the room in which her father was, and could tell if he was in the room, though ever so dark, by the effect it had upon her disorder.

The salutary effect of music still continued; and she now danced upon her feet with as much accuracy as she had before shown in following the tune with her hands. Her propensity for this was discovered by her movements with her feet as she lay on the bed.

It was in the fore part of the day when I called to see her. She lay in a motionless state upon the bed, every nerve and muscle being contracted. In this situation she had been from the early part of the preceding evening; not having spoken, nor taken any notice of the music, which was now made by an excellent performer on the violin; singing having before this time lost its influence upon her. It was only of music of this kind that she would take any notice.

He had, in vain, tried to rouse her during the night. I desired him to make a further trial, by putting the instrument near her ear, and playing a brisk air. This had the desired effect. I soon observed her fingers, and then her eyelids, to relax. As she opened her eyes I discovered nothing but the white; the whole cornea, or coloured part, was turned over upwards into the socket, by the violence of the spasm upon the muscles of those parts.

She then began to follow the tune with her fingers, and shortly after came out of the fit, got up, walked about, and adjusted her dress. We remained out of the room a few minutes: when we went in she had thrown herself upon the bed, and was in the same motionless, contracted state, as when I first came in.

She remained thus until the violin was brought. After the music began, she made motions first with her hands and then with her feet. This was the signal for helping her up. A young man, not one of the family, but a distant relation, happening that instant to enter, attempted to assist her; but the moment he touched her she shrunk back with a seeming horror, although her eyes were closed, and would have gone into violent

convulsions, if he had not desisted, by desire of the musician. I not being related, helped her on her feet. She soon commenced dancing, in which exercise she remained near an hour and an half, with very little intermission. She danced with all her might, jumping a considerable distance from the floor, and continued the exercise so long that, being entirely exhausted, she would fall, without attempting to prevent it, like a log upon the floor. After panting with great emotion a few seconds, she would resume the exercise.

After having kept her dancing till she refused the exercise any longer, she was again laid on the bed, and fell into the same state of stupor as before.

Whilst dancing, her eyes all the time were closed, which appeared to proceed from the violence of the spasms; as to me, indeed, did all her motions. The conjecture may be too bold, but I will venture to suggest it—that those spasmodic affections which were so violent were brought into a system of regularity by the power of music upon the auditory nerves, and sympathetically communicated from them to the other nerves of the body; and thus was her whole dancing spasmodic and involuntary.

One circumstance, among others, which corroborates this opinion, is, that in a very violent paroxysm, when the music would for some time lose its effect, and her spasms were so excessive that her friends were apprehensive they would prove fatal, when first the music would make an impression, it would cause the motions of her body, in dancing, to be as extravagant as the spasms had been violent.

No one would pretend that the spasms which preceded her dancing, and into which she would fall in case the music ceased, were dependant upon the will. And it appeared very evident that her dancing was nothing more nor less than a modification of those spasms, one terminating in the other, and *vice versa*.

When I left her, I recommended to her friends to keep her dancing as long as possible when she once began, and to trust to it as a principal remedy. It was my opinion that nature in this way pointed out relief.

I was afterwards informed that this advice was followed, and it was attended with this effect: it protracted the space between her fits to a longer period than ever before it had been. When they returned they were as severe as ever, though the interval was lengthened from days to weeks.

The next time I saw her I observed a surprising acuteness

in her olfactory nerves. She had manifested a partiality for the smell of certain odoriferous substances. Essence of lemons was one of those she liked best. She was in a partial paroxysm when a vial of it was introduced, and held towards her. She drew in the scent by an incessant and convulsive kind of snuffing. It was afterwards carried out of the room, and she, with her eyes shut, directed her head toward the passage the person went out at, still snuffing. Before it was carried out, the musician rubbed the end of his finger around the mouth of the vial. He did not turn it up, and there was not the least particle of the essence, in a fluid state, upon that part. There was the remains of the oil, having a yellowish appearance, the thin part being entirely exhaled.

After the vial was removed, he put his finger under the bed on which she was lying, about half way between it and the floor. She instantly turned over on her face, applying it to the bed, that she might be able to inhale the beloved odour in a right line, which she did with the greatest eagerness. As she emerged still more from the fit, so as to open her eyes, she discovered a remarkable partiality for certain colours, and an aversion to others. Green and red were among the former; white and black, and their mixtures, among the latter. If the agreeable colour was presented, and moved or shook in her sight, it appeared to produce the greatest pleasure, which she evinced by a convulsive kind of laughter, very hearty, yet not natural. If white or black was presented, she would turn away her head with a marked aversion and seeming horror. The sight of any thing transparent, and water slowly poured from one vessel into another, produced the same effect as her favourite colours.

After this visit I frequently called to see her, as my professional avocations led me into her neighbourhood.

Every new paroxysm was attended with some variation; but the most striking phenomena were a repetition of what I have already related: the others were referable to the same cause in a less degree, that is, *increased sensibility.*

She continued to have her fits return at irregular periods, sometimes with intervals of four or five weeks, until the month of August, 1802. She was then seized, whilst from home, with a pain in that hand upon which the spider had crawled the December before; and the spot where she said the spider had bitten her soon became red. The pain increased for two or three days, when a spot, as large, or a little larger

than a half dollar, began to turn black, and threatened gangrene. Dr. Perry, who happened to be in her neighbourhood at this time, called to see her, and ordered the cortex ruber in substance. By the use of this, and some simple topical applications, the mortified part cast off, leaving a spot of an irregular shape, very much resembling a burn.

During the soreness of her hand she was again seized with fits, but they were not so violent as formerly.

When I saw her, which was, I think, on the fourteenth of the month, she lay in a state of stupor similar to that I mentioned above.

The people about her remarked that her hearing was very acute, and that she had been known to understand the conversation of persons in a whisper, though in another room. I did not witness any instance of this; but the lady who related it to me, related it from her own knowledge, and is of the first respectability, and unquestionable veracity. The young woman was then at her house, and from other instances of the extreme sensibility of her nerves, which I witnessed myself, and the aptitude I observed in that sensibility to change from one set of organs to another, I make no doubt of the fact.

Her hand, soon after this period, began to discharge a very unusual kind of matter. It was as green, and almost as thick as inspissated beef gall. This matter was discharged in such quantities, for two or three weeks, as to require the sore to be dressed three times a day; and although several folds of linen were laid over the dressings, they would be soaked through before the next dressing, and a large quantity of matter collected on her hand. The fits abated when the discharge began, and she has since had no return of them, and nearly five months have now elapsed. The discharge gradually lessened, and the sore healed. Once during this period the discharge suddenly stopped, upon which she grew very unwell, and was threatened with fits, but upon its re-appearing she grew better.

She is a girl of good habit of body, never having been subject to any particular disease, and, in general, very healthy.

Her temperament I should place in the *sanguineo-choleric*.

It was observed by the family, that during the discharge from her hand the arm of that side was considerably diminished in size.

I never observed her complaints accompanied with any pyrexia, nor was her flesh, during her illness, diminished in any considerable degree.

I once saw her in a partial paroxysm, when she appeared very sick at her stomach, and kept continually retching. I ordered some warm water to be given her, but she did not puke it up; and what she evacuated did not appear to come from her stomach. It was a mucous matter, appearing to come from the mucous follicles about the fauces, and, I conclude, an increased secretion of that fluid, as she evacuated considerable quantities of it. It was thus that she threw up pins and needles, which, in the agony attending her fits, she would, I conceive, unwittingly put in her mouth, and in this way get rid of them; which gave rise to a vulgar report, that she swallowed those substances, and then puked them up.

A case so replete with the wonderful is not, perhaps, easily to be found in the annals of medicine; and it is to be wished that a more accurate account had been kept of it. But from the length of time she was sick, and from the circumstance of no one physician attending her constantly, and a great part of the time none at all, this was impracticable.

I have endeavoured to collect the leading and most prominent symptoms, and rather to lessen than exaggerate those which partook so much of the marvellous.

In relating thus much, I may, perhaps, be charged with presumption by some; but I have no fear of this from those who will take the trouble to inquire into the numbers and credibility of those who witnessed every part of my narrative.

Respecting the insect which I have supposed to be the cause, it seems natural to make some remarks. It may be objected that the tarantula (phalangium apulianum) is not an inhabitant of our climate. And this objection, so far as I know, is well founded; that being a name given to a particular species of spider in Italy. But I think we have a spider in this country whose economy is somewhat similar to the description given of that; and, if it be not the same species, may be equally poisonous. I will not contend about names. That she was poisoned by a spider, considering every circumstance, will seem hard to deny. She was heard to say, by a person near her, at the time she was at the stack, "O, what a great spider there is!" And then the first complaint being in that arm, and ending in the same, and a sore of an unusual kind appearing in the very spot where she all along had said the spider had bitten her, are pretty strong proofs of her having been bitten; not to mention that such a strange illness would naturally lead us to look for an unusual cause. In some of the symptoms we observe a similarity to those occasioned

by the Italian spider, but here we cannot trace a parallel clear through.

The spider of Italy produces a disorder which, as their physicians say, is cured by music. Here the parallel fails. In this case the patient was evidently cured by a spontaneous discharge of matter at the very spot where we suppose the poison first entered the blood. In respect to those remarkable effects, the consequence of increased sensibility, we have no parallel that I know of. In respect to the partiality for, and antipathy to certain colours, the parallel is exact in the two countries. In respect to music being the cause of the patient's dancing, and also in its affording relief to the complaint, there is an exact similarity between this case and those described by the Italians. In respect to the partiality shown for her kindred at one time, and the remarkable aversion evinced at another, I know of no parallel.

The lateness of the season in which I have supposed the spider to have appeared has not been offered as any objection to its appearance; nor will that be adduced by any one who recollects the extreme mildness of the fall months, and the month of December that year. It was observed to me by the father of the young woman, that the warmth of the day on which his daughter went to the stack was such, that she and another young woman took off their outside garments, and sat in the door to work. It may be proper to remark, that when I first saw her I could perceive no mark upon the spot where she supposed the spider had bitten her. This was, however, as late as the fortieth day; and if it had been earlier examined, it is not very probable that any very perceptible mark from an insect which inflicts a wound in the manner of the tarantula could have been discerned; it not being by biting, but by pricking with a very fine pair of horns or forceps, and, at the same instant, spitting from its mouth the poisonous fluid upon the wound: therefore it cannot appear strange that the puncture should be scarcely if at all visible at first.

I consider the remarkable increase of sensibility as constituting a part of the disease; she never showing any signs of it when she was entirely out of her fits.

Perhaps this case may furnish us with some new light relative to the treatment of nervous diseases. If my theory be right, may we not expect much benefit from music in hysteria?

I have had one case only in which I had an opportunity of trying it: it was an obstinate hysteric one. It was attended with the advantage I expected. It moderated the spasms, reduced them to order, and shortened the paroxysm.

ARTICLE II.

OBSERVATIONS *on the* PLANT *called* BONE-SET, *and on other* SPECIES *of* EUPATORIUM, *tending to evince their anti-venomous Qualities. By* JOHN STEVENS, *Esq. of Hobocken. Communicated to Dr.* MITCHILL, *in a Letter dated July* 5, 1803.

AGREEABLY to promise, I now send you some particulars respecting two or three species of a family of plants, which form a natural genus, designated by Linnæus under the title of *Eupatorium*. Professor Martyn, in his late edition of Miller's Gardener's Dictionary, has enumerated and described 49 different species of this genus, thirteen of which are natives of North-America, one only (Eupatorium Cannabinum, common hemp agrimony) is to be found in Europe, and the remaining thirty-five are from the East and West-Indies. Respecting the European species, Martyn tells us that "the whole plant has a very bitter taste: a handful of it vomits and purges smartly. An ounce of the root in decoction is a full dose, and is sometimes taken in the jaundice, dropsy, &c. but it is a rough medicine, and ought to be used with caution. Boerhaave gave an infusion of this plant to foment ulcers and putrid sores. Tournefort informs us that the Turks cure the scurvy with it."

During the prevalence of the yellow fever in the city of New-York, my attention was attracted towards a plant commonly called by the country people in this neighbourhood *Bone-set*. I found it had long been in high reputation among them for the cure of intermittents; but it was now confidently asserted to be a specific against yellow fever. I at that time took some pains to gain information respecting so interesting a subject; and the result of my inquiries was highly favourable to the efficacy of this plant. A case, which occurred more immediately under my own eye, I will now give you. A strong, healthy young man, who lived about a mile from my house, occasionally attended the Hudson-market in New-York, where, at that time, the fever prevailed. On his return one day he was taken so suddenly ill as to be totally disabled from rowing his boat. A neighbour, seeing his distress, came off to his assistance, and took him home. He had every symptom which usually attends an attack of yellow fever. His wife put him to bed, and prepared for him a decoction of the leaves

of the bone-set, of which he drank very plentifully. It puked and purged him severely, and finally threw him into a most profuse perspiration. In a few days he was able to go to work again. To be sure, it cannot be positively asserted that this man was attacked by yellow fever, but, from the circumstances of the case, it is highly probable.

During the prevalence of the fever in Philadelphia last summer, I addressed a few lines to the President of the Board of Health, recommending the use of the decoction of this plant in the hospital; but I have not learned that any trials were made of it.

This valuable plant is the *Eupatorium Perfoliatum* of Linnæus. I have lately discovered three other species, which are at present growing in my garden.

The wonderful properties ascribed to the *Aya-pana* and to the *Vejuco du Guaco*, which are unquestionably both of them species of Eupatorium, ought to excite the attention of the botanist and physician to investigate the medicinal qualities of the different species of this remarkable genus of plants.

Some very curious details are given respecting the *vejuco du guaco*, and the *aya-pana*, in the Philosophical Magazine, vol. xii. p. 36, and vol. xiii. p. 376, which I have extracted, and made a part of this communication.

The first is written by Don Pedro D'Orbiës y Vargas, to Count Rumford, on the virtues of the plant by which the Indians at Santa-Fé preserve themselves against the bite of venomous serpents.

"The abundance of venomous serpents found in the warm districts of America has rendered it necessary for the unfortunate Indians and negroes, who traverse the woods almost always barefooted, to search out the most efficacious remedies for the disagreeable effects produced by the bite of these animals. Of the remedies hitherto discovered, none is equal to the juice of a plant of the creeping kind, called *vejuco du guaco;* for it not only cures the maladies arising from the bite of serpents, but preserves from its effects those who have drunk of it before they are bitten; so that the negroes and Indians acquainted with this plant, lay hold, with their naked hands, of the most venomous serpents, without sustaining any injury from them. This knowledge, of which they formerly made a great mystery, gave them much importance in the country; and there is no doubt that they gained a great deal of money, both from those who were bitten by serpents, and

from those who were desirous, through curiosity, to see them handle these dangerous animals.

" Being born in the kingdom of Santa-Fé, belonging to South-America, I had often heard the inhabitants boasting of the great ability of these negroes, whom my countrymen call *empirics*. But as in the capital, where I was educated, which lies in a cold district, there are no venomous serpents, I had no opportunity of seeing any till the year 1788, when, being at Margerita, I heard of a slave who had a great reputation as being invulnerable to serpents, and who belonged to a gentleman of that place. As I was resolved to examine him myself, I begged his master to send for him, with a sufficient provision of serpents, which he readily consented to do.

" On the 30th May, the same year, the negro came to the house where I resided with one of the most venomous serpents of the country, which he had put into a calabash; a kind of vessel employed by these people for the same purposes as bottles are employed in Europe. Having informed him that I was desirous of seeing a specimen of his talents, he replied that he was ready to gratify my curiosity, and, taking the serpent from the calabash, handled it with so much confidence and composure that I imagined he had previously deprived it of its teeth that contained the poison. I therefore caused him to open its mouth; but I saw that it still had its teeth, and was convinced that the negro possessed some secret for soothing it, for it appeared as tame and harmless as the most innocent animal could have been. After a long conversation with the negro, of whom I asked several questions, to which he gave the most pertinent answers, I informed him how much I should be gratified if I could be enabled to handle serpents with the same security; and finding he was not averse to procure me that satisfaction, I offered him a recompense, with which he seemed satisfied. Next morning he returned with the leaves of the plant in question, which he moistened, and, having bruised them in my presence, made me drink two large spoonfuls of the juice.

" He then made three incisions between my fingers in each hand, in which he inoculated me with the same juice: he performed a similar operation on each foot, and on each side of my breast. When these operations were finished he informed me that I might lay hold of the serpent. I made several observations to him in regard to the disagreeable consequences to be apprehended in case I should be bit by the animal; but finding that he seemed confident in his skill, I resolved to take it into my

hands without any fear, which I did several times, the animal never making the least attempt to do me any injury. One of the individuals, however, who were in the house, being desirous to run the same risk, was bit by the serpent the second time he took it in his hand, but without any other inconvenience than a slight inflammation in the part.

"Two of my domestics, who had been also inoculated, encouraged by this first attempt, went out into the fields, and soon brought with them another kind of serpent, equally venomous, without sustaining any hurt from it. In a word, I have caught several since that time, without any other preparation than that of having drunk a little juice of the *vejuco du guaco;* and after repeating these trials, either on myself or my domestics, and always with the completest success, I resolved, in 1791, to give a memoir on this remarkable antidote, in a periodical paper published every week at Santa-Fé. I added a description of the plant, and every thing that appeared to me necessary for rendering public and general this discovery, so useful to mankind. An account of all my experiments, and of the persons who were present, will be found in that paper, dated Sept. 30, 1791.

"I shall here only observe, that the tradition current among the Indians and negroes of the vice-royship of Santa-Fé, respecting the manner in which the virtue of this plant was discovered, is as follows:—A bird of the kite kind, described by Catesby under the name of the *serpent-hawk*, feeds chiefly upon snakes in the hot and temperate regions of that part of America. This bird has a monotonous cry, sometimes very disagreeable by its repetition, which imitates the articulated word *guaco*, on which account the inhabitants have given it that name; and these people say, that when it cries it is to call forth the serpents, over which it exercises a certain kind of authority. They add other extravagant fables: but it is certain that the *guaco* pursues them wherever it finds them; and that the Indians and negroes, who spend the greater part of their time in the forests and open fields, assert, that to take them with more safety, they prepare themselves by eating some leaves of the plant in question. This may be true; they may have discovered the virtue of it, and experienced it with success. In this case, as in many others, the instinct of animals has been of use to us.

"In regard to the plant, its genus has not yet been classed in any book of botany I have ever seen; and for that reason I shall venture to give a description of it as well as I can,

taking advantage of the memoir above-mentioned. The root is fibrous, and extends in every direction. The stem is straight, perfectly cylindric when the plant is tender, but when old becomes pentagonal, that is to say, acquires salient angles. The leaves which grow on the stem stand opposite to each other; are shaped like a heart; have a dark green colour, intermixed with violet; are smooth on the lower side, rough on the upper, and somewhat velvety: its corymbiferous flowers are yellow, flosculous, and have four fleurons in each common calyx. The corolla is monopetalous, infundibuliform, with five indentations; and contains five stamina, united by antheræ, in the form of cylinders, which embrace the style. The style has a stigma deeply divided, and the calyx contains several broad seeds, each with a silky aigrette.

"The plant is vivacious, and is found in the hot and temperate regions of the vice-royship of Santa-Fé. It is, in general, fond of growing on the borders of rivulets, and in shady places, rather than in the open plains. Nature has not produced it in the elevated or cold districts of this continent; and for this reason, no doubt, that its virtue would be useless, as there are no venomous serpents but in the countries where it grows."

The second extract is from a paper read before the French National Institute by M. Ventenat, on the remarkable properties of a Brazilian plant, named there *aya-pana*.

"The *aya-pana* grows in South-America, on the right bank of the river of the Amazons. The inhabitants of that country have long considered it as an excellent sudorific, and a powerful alexipharmic, or antidote against the bite of serpents, and the wounds made by poisoned arrows. Its virtues are equally extolled throughout all Brazil, where it is carefully cultivated, and where it is distinguished by the name of the *miraculous plant*. It is cultivated also in the Isle of France.

"The properties of the *aya-pana*, if the information communicated to me, and that since transmitted to Madame Bonaparte and C. Jussieu, by Capt. Augustine Baudin himself, can be credited, are not belied at the Isle of France, where this plant enjoys as great celebrity as in its native country. The garden of government is continually beset by diseased persons, who come to solicit a few leaves of the *aya-pana* to cure their maladies. The colonial gazette daily contains some new proofs of its virtues; and it is employed with success not only against the bite of serpents, but also for curing the dropsy, syphilis in its most inveterate stages, and all sorts of wounds.

" Among the great number of cures effected at the Isle of France by means of the *aya-pana*, and announced in the gazette already mentioned, I shall select three or four, which will show the manner of administering this plant, and the different doses employed, according to the purposes for which it is applied.

" A planter of the Isle of France (C. Cotte) was stung in the right hand by a scorpion: a violent inflammation, accompanied with acute pain, immediately took place. Capt. Baudin advised him to make use of the *aya-pana*. Several leaves were pounded, and applied to the wound: the pain immediately ceased: at the end of two hours there was no more inflammation, and the hand soon returned to its natural state.

" C. Ponset, an officer of artillery, brought to Capt. Baudin a negro, who, while fishing, had been pricked by a fish known under the name of the *last*. The prick of this fish is so venomous, that, before the *aya-pana* was known, amputation of the wounded limb was the only remedy. The hand of the negro was very much swelled. Capt. Baudin recommended the application of the *aya-pana* pounded; and as he supposed that a great deal would be required to effect a cure, he induced C. Ponset to send some person to the garden of the state to procure a considerable quantity of the leaves, in order that the hand of the patient might be wrapped up in them. But as the garden was at the distance of three leagues, and as the patient suffered a great deal from the pain of the wound, Capt. Baudin resolved to take seven or eight leaves from a young shoot which he had at his house. These he caused to be pounded, and then applied to the part affected. Next day the hand of the black was completely cured.

" A black, whose belly was much swelled, and exhibited symptoms of a dropsy, having applied to a surgeon, the latter resolved to tap him: he, however, deferred the operation, because he had other patients to visit. Being urged by the master of the black to prescribe for him, he said, by way of derision, " Give him an infusion of *aya-pana* till I return." The surgeon's orders, happily for the patient, were literally complied with. The dropsy made no further progress; the symptoms gradually disappeared; and at the end of a few days the black was in a condition to resume his labours.

" Capt. Baudin, in going on board his vessel, happened to fall and hurt his left leg very much. It was necessary, on his being carried home, to cut off his stocking, in order that the wound might be dressed. Capt. Baudin ordered some leaves

of the *aya-pana* to be boiled; and when the decoction was tepid, the wounds were washed with it, and the leaves used for making the decoction were applied to them. The leg was then wrapped up in several folds of a bandage dipped in the same liquor, besprinkling it anew every ten minutes. About two hours after the first dressing, the inflammation had so much abated that the patient was able to walk with the help of a stick, and at the end of thirteen days he was perfectly cured.

"I could mention a great many more cures effected by means of the famous plant of Brazil; but, as it is not prudent to certify any facts of which one has not been a witness, we ought, in my opinion, to wait till the virtues of the *aya-pana* have been confirmed by the continued observations of able physicians. The testimony, however, of Capt. Baudin, and that of several persons lately arrived from the Isle of France, are entitled to some confidence, and give us reason to hope that the *aya-pana* may increase the number of our vegetable productions employed for relieving or curing the evils incident to the human race.

"It is to be presumed that this plant will be soon multiplied in the gardens of the capital. C. Michaux, who has rendered so great services to botany and agriculture, has sent seeds of it to C. Cels, and Madame Bonaparte has received some from the director of the garden of the state; but as the seeds do not always produce plants, it is to be wished that some living shoots of it could be obtained: they might easily be multiplied from slips, and it might then be possible to form some decisive opinion in regard to the virtues ascribed to this plant.

"Though we are allowed to doubt the virtues of the *aya-pana*, the botanical characters of this plant are so simple and easy to be known, that there cannot be the least uncertainty in respect to the genus to which it ought to be referred. The examination I have made of several complete plants, has proved to me that it belongs to the family of the *Corymbiferæ*, and genus of *Eupatorium* of Linnæus.

"The stem of this plant, which I have called *Eupatorium aya-pana*, is straight, full of branches, of a dark brown colour, about three feet in height, and of the size of a goose-quill. Its leaves are alternate, almost sessile, lance-formed, and very entire; the flowers are of a bright purple colour, and disposed in corymbi at the summit of the stem and branches.

"The *Eupatorium aya-pana* may be distinguished from other species of this genus by the following character: *Eupatorium foliis lanceolatis, integerrimis, inferioribus oppositis, superioribus alternis; calicibus subsimplicibus, multifloris.*"

What a valuable acquisition would these plants prove! Could not some means be fallen upon to effect their introduction? Perhaps it would be well to insert a short account of them in the different newspapers in the sea-port towns throughout the United States, requesting, at the same time, captains of vessels, and others, trading to any of the ports of South-America, to make inquiry after them, and, if possible, to procure some living plants. The person who shall be the means of introducing either of these plants, will probably do an essential service to his country.

ARTICLE III.

ACCOUNT *of the* SPECIES, HYBRIDS, *and other* VARIETIES *of the* VINE *of* NORTH-AMERICA. *By Mr.* WILLIAM BARTRAM, *of Pennsylvania.*

To the Editors of the Medical Repository.

GENTLEMEN,

The following observations upon the Vines of the United States were written by Mr. WILLIAM BARTRAM *last spring* (1802), *in consequence of my determination, expressed to him, of publishing the natural history of the Vines of our country, and of a request that he would favour me with the result of his remarks on that interesting subject. It was my intention originally to use the valuable information as I should want it, in the progress of my undertaking; but I have deemed it best to publish the whole paper in your truly valuable work, in order to circulate speedily its valuable contents; particularly to give an opportunity of comparing the living vines with the botanical description during the present season, and to diffuse the knowledge of the erroneous and perplexing arrangement of* LINNÆUS *and* WALTER *on this subject.*

It is my present intention to publish the description of one species of vine every year in Latin and in English, with a coloured plate, and I had made arrangements for the

publication of the first fascicle last year; but the very unfavourable season, which had prevented the ripening of the species (Bland's Grape) I had resolved first to describe, obliged me to defer the task until the present year, when I hope the weather will prove more favourable. Medical gentlemen, and others fond of natural history, and anxious to have the description of American vines and their classification completed, will have it much in their power to assist my undertaking. I have taken measures to have the Bull, *or Rullet grape of Carolina and Georgia, sent me; but I shall nevertheless be much indebted for any specimens of the plant that may be transmitted.*

Respectfully,

JAMES MEASE.

Philadelphia, June 3, 1803.

THE most obvious characters which distinguish the Grape-Vines of America from those of the old continent, are, 1. The berries of all the American species and varieties that I have seen, approach the figure of an oblate spheroid; that is, the poles are flattened, and the transverse diameter is longer than the polar: however, I have observed that Alexander's grape, and some of the bullet grapes, approach nearer to an oval or ellipsis, which is the figure of all foreign or European grapes that I have seen; viz. a prolate spheroid.—2. Most of the American species and varieties have a glaucous and yellowish pubescence on the under surface of their leaves.—3. All that I have observed in the northern and eastern districts of the United States are *polygamous;* i. e. those vines which bear fruit (female) have hermaphrodite flowers (pentandria monogynia); but the males have only five stamina, without any female organ, and are always barren. One would suppose, from WALTER so strongly marking this character as to induce him to place Vitis in the class *Dioecia*, when LINNÆUS and the other European botanists had placed it in Pentandria (he himself being an European), that all the grape-vines of the old continent are hermaphroditous and Pentandrian. I know not, from my own observation, whether the bull-grape of Carolina is hermaphroditous or dioecious, and therefore rest satisfied with Walter's assertion.

With regard to the vine of America, I find a great difficulty in discriminating the species from varieties or hybrids, which,

perhaps, may be partly accounted for from some of our vines being dioecious, and there being a much greater number of male vines than of fruit-bearing ones, whose *farina fecundans*, mixing with the air and winds, is carried to a great distance to the female organs of hermaphrodite flowers. I shall now give my opinion of the distinct species or established races from which all the varieties or mules have originated.

1st. The COMMON BLUE GRAPE, or BUNCH GRAPE, *Vitis sylvestris*, or *V. occidentalis*. This is the most common grape. The acini or berries are of the oblate figure, of various sizes on different plants, and of as various tastes. Some are sweet and pleasant enough, having a musky flavour. They are nearly as large as the Burgundy grape; are black when ripe, having a glaucous bloom, like the damson plum. The leaves of this species are large; their under surface covered with a clay-coloured down or pubescence. They are tri-lobed, each lobe subdivided or dentated. Some varieties have very deep sinuosities, almost touching the mid-rib.

2d. FOX-GRAPE, *Vitis vulpina* of Bartram, *V. foliis cordatis subtrilobis, dentatis; subtus tomentosis*, Linn. *Spec. plant. V. vulpina dicta Virginiana alba; Pluckn. alm.* 392. *Vitis vulpina dicta acinis peramplis purpureis in racemo paucis, sapore fœtido et ingrato præditis, cute crassa carnosa.* Clayt. n. 696. The last part of the description is decisive; every word true when applied to our fox-grape of Pennsylvania; and Dr. Clayton's authority should be relied on, as he was a native of Virginia, spent his life there, and was an excellent botanist. The leaves of the fox-grape are large and lobated, not much unlike those of the common bunch grape, but not so deeply sinuated and toothed; their under surface thickly covered with a yellow pubescence or down; the fruit bunches short, having few acini or berries on them, but these few are large, and of an oblate figure. Some are as large as a musket-ball, and are of different sizes and colours; black, red, purple, green and white, when ripe. All possess a strong rancid smell and taste, have a thick coriacious skin, and a tough jelly-like pulp or tegument which encloses the seeds. Between this nucleus and the skin is a sweet lively juice, but a little acerb or stinging to the mouth if pressed hard in eating them. There is another property of this grape which alone is sufficient to prove it to be the *Vit. vulpina*, that is, the strong rancid smell of its ripe fruit, very like the effluvia arising from the body of the fox, which gave rise to the specific name of this vine, and not, as many have imagined, from its being the favourite food

of the animal; for the fox (at least the American species) seldom eats grapes or other fruit if he can get animal food.

The vines, though they make vigorous and extensive shoots, never mount high, but ramble over shrubs and low trees to a great distance from the original root. This appears to be the V. taurina of Walter, and the labrusca of Linnæus.

3d. BULL-GRAPE, *Vitis taurina* of Bartram, *Vit. vulpina* of Linnæus and Walter. This excellent grape is called by the inhabitants of Georgia, Carolina and Florida, *Bull-grape.** The preceding species is called *fox-grape* from Pennsylvania to Florida. The bull-grape has a stiff, ligneous, smooth stem, of pale ash-colour, and mounts to a great height by climbing up trees. The leaves are cordated and serrated, thin, and both surfaces naked or smooth. The racimes or fruit bunches short, containing 15 or 20 grapes at a medium. The berries or *acini* are large, near the size of a rifle-ball; of a black colour when ripe; having a bluish nebule over them, which being rubbed off, they appear of a deep blood-colour. In figure they approach to an ellipsis or prolate spheroid: however, at a little distance they appear black and round. This species is deservedly esteemed the best native grape in America, and would make a rich and delicious wine. The juice is sweet, rich and lively, and there is but little of the tough jelly-like substance enclosing the seed. The skin of the grape is rather thick, yet there is a sweet melting pulp within, which mixes with the saccharine juice when eaten. This undoubtedly is the first American grape which merits attention and cultivation for wine. It thrives in every soil and situation from the sea-coast to the mountains; it even thrives and is fruitful when growing in the barren sand-hills of Carolina and Florida.

4th. WINTER-GRAPE, *Vitis serotina.* Cotyledon palmated. This is a vine remarkable for its sweet flowers. It mounts to the top of high trees; the stems and twigs more hard and ligneous than the bunch grape, to which I think it approaches the nearest. The leaves are small, cordated, smooth, thin and serrated. The fruit bunches branched, but the berries small and black, not so large as currants: the fruit not ripe till late in the autumn, and the juice extremely sour and ill-tasted, so

* Mr. Bartram lately informed me that the word bull is an abbreviation of bullet; the grapes being so called from their approaching nearly the size of a bullet. The name "*taurina*" is, therefore, not the most proper.

J. M.

that even birds will not eat them till winter frosts have meliorated them.

I shall now mention the varieties that appear to me to have arisen from a commixture of the several species or races.

Alexander's or *Tasker's grape* is a large grape, black or blue, the size of the fruit of the *Vit. vinifera* of the old continent. The grapes approach to the elliptical figure. They are, when fully ripe, perfectly black, and as sweet as any grape. Many persons think them too luscious. Before they are quite ripe some think they possess a little of the stingy taste of the fox-grape, but my taste never could discover it. It has been supposed to be a hybrid between *Vit. sylvestris* (common bunch grape) and *Vit. vinifera*, because it was found on the rocky hills near the river Schuylkill, above the upper ferry, in the neighbourhood of an old vineyard of European grapes; but I believe it to be an American.

Bland's grape. This is an excellent grape. The bunches large, branched, and well shaped, six or eight inches in length. The berries large, about the size of the common white grape of Europe, and round or oblate; when perfectly ripe, of a dark purple or red wine colour; the juice sweet and lively, having a little musky flavour, with a small portion of an agreeable astringency, somewhat like our best bunch or wild grapes, though much sweeter than any of them. If this grape is what I take it to be, a genuine American, it is a hybrid or variety. It was found in Virginia, where it is called the Virginia muskadell, and sent to me by the late Col. Bland. This excellent grape bids the fairest, next to the bull-grape, to afford a good wine.

There seems to be no end to the varieties of Vit. sylvestris, or *bunch grape*, in size and taste of the fruit, as also in the leaves. There is a middle-sized round grape, called *Raccoon-grape*, which appears to be much of the nature of the fox-grape: they are black when ripe; have much of the stingy taste and rancid smell of the fox-grape, and the tough jelly pulp that envelopes the seed; the skin thick; but they are not more than half the size of the fox-grape.

Thus it appears to me that we have in the United States four species of *Vitis* or grape vines, viz.

1. *Vitis sylvestris*, or *Vit. Americana*, or *occidentalis*, common bunch grape.
2. *V. vulpina*, fox-grape.
3. *V. taurina*, bullet-grape.
4. *V. serotina*, winter-grape, by some called Bermudian grape, and innumerable varieties and hybrids.

By varieties I mean different sorts of an individual species, and by hybrids, spurious offspring by intermixture of species. Of the latter sort are,

1. Alexander's or Tasker's grape.
2. Bland's grape.
3. Raccoon-grape.

ARTICLE IV.

CASE *of* ANEURISM: *Communicated by Dr.* JOSHUA E. WHITE, *of Waynesborough (Georgia), to Dr.* DAVID RAMSAY, *of Charleston (S. C.)*

ON Thursday, the 23d of May, 1799, I was requested to visit Mrs. P. aged 55 years, living a few miles from this place, who, since Christmas last, had been troubled with a tumour under the upper part of the sternum, which her friends supposed to be what is commonly called a wen, and for the extirpation of which I was called. During the last three weeks the swelling had increased rapidly in size. The integuments were much distended; the cutis had changed colour, and become of a very deep red. Upon examination I found it to be immoveable, of a firm consistence, and the surface smooth and equal. Throughout the whole of it a strong and violent pulsation was to be felt, which was evident to the sight at the distance of several feet. Its nature, unfortunately for the patient, was too evident, and I did not hesitate to pronounce it to be an aneurism. The patient suffered much pain, not only from the tension of the skin, but from its weight. She could not lie down with any tolerable ease, and she had shooting pains in different parts of her breast. The tumour was about ten inches in circumference round the base, and the contents could not be made to recede the least upon pressure. A few days previous to my seeing her, two small punctures had been made in the anterior part of the swelling, at her request, upon the supposition of its being an abscess, and with a view of discharging its contents. Neither of them penetrated the aneurismal sac, though one of them divided the external coat of the artery; for at every diastole of the heart, the thin internal coat (which might here be emphatically called the "thread of life") was evidently pushed forward, and seemed every moment ready to yield to the *vis à tergo*. The

discharge of blood from the vessels of the skin afforded her considerable relief from pain and tension.

The patient could not trace the origin of the tumour to any certain cause: hence it most probably arose from a partial weakness of the aorta. She had been for many years affected with the chronic rheumatism. About twelve months before the present tumour made its appearance, a smaller one had discovered itself in the same place; but which, in a short time, disappeared, without any application. With the complicated distress of pain, restless nights, and unpleasant forebodings, the patient was anxious for relief, and entreated me to do something towards it. For the removal of the tumour, no remedies, I told her, could be applied; and her friends were made acquainted with its nature, and the inevitable result. To support it against the violent impulse of the blood, I advised a covering of thin sheet lead: rest was strongly enjoined, and anodynes were occasionally directed. Expecting the tumour would soon burst, and prove instantly fatal, I left her. This event took place in a week. The discharge of blood was so enormous and sudden, that the by-standers compared it to its being "poured from a pail suddenly turned upside down." The orifice was about the size of a dollar. She expired without a groan, and in an instant: permission could not be gained to open the body. Thus we are left in ignorance as to the effects produced upon the lungs, &c. There was an evident separation of the clavicles from the sternum (most probably from an absorption of their substance), and this last was considerably elevated. The hardness which I have noticed most probably arose from a deposition of matter which sometimes takes place round an aneurismal sac, and which, in some instances, has been known to approximate to a cartilaginous or osseous nature. The person who made the punctures said "it cut like gristle."

That the action of an artery should be able to produce such a derangement or loss of substance as appeared to be evident in this case, not only in the clavicles, but also in the sternum and ends of the ribs, may, at first view, appear surprising; but our wonder will cease when we know that the most violent effects are sometimes produced upon bones, as well as the softer parts, by the pulsation of a large artery in an aneurism; that the former may be, and often are, separated from their joints, elevated or displaced from their natural situation, and sometimes entirely dissolved.

ARTICLE V.

ADDITIONAL OBSERVATIONS *on the* SUBTERRANEAN MINERALS *near the* YADKIN, *and on their* BASALTIC NATURE. *By* JAMES WOODHOUSE, *M. D. and Professor of Chemistry in the University of Pennsylvania: Addressed to the Editors of the Medical Repository, July* 14, 1803.

GENTLEMEN,

SINCE my return from Europe to America, I have not met with any thing which has afforded me more entertainment than the reply of the Rev. Mr. Lewis to my letter concerning the subterranean wall of North-Carolina. When this subject was brought before the public, in the year 1798, two questions were involved:

First. Whether the stones composing the wall were basaltic; and,

Secondly. Whether the wall was a production of nature or of art.

In a postscript to a letter of Mr. Lewis's, published in the fourth volume of the Medical Repository, p. 233, he pronounces, in the most positive manner, that the stones composing it are not basaltic. He concludes his remarks, in *four* places, in the following words: "*consequently the wall cannot be basaltes.*" But in his reply to my observations, in the fifth volume, p. 404, he says, "*the question in dispute is not, whether the materials are basaltic, but whether the wall is a work of art or of nature.*"

It is not my intention to bring forward any arguments, in addition to those already published, to prove that this wall is basaltic. A mineralogist can distinguish basaltes from any other stone merely by inspecting them, as well as any other person can tell an apple from an orange, a pear from a peach, or any one common production of nature from another.

The chemical analysis, likewise, of the solid stones, and what is improperly called rust and cement, demonstrates, in a satisfactory manner, to chemists, that the stones are basaltic; and there can be no appeal from the experiments, except by showing that they have been made in an improper manner.

Mr. Lewis has asserted, on authority which he says is too direct and respectable to admit, for a moment, a doubt of its

correctness, that I reported, after his reading my reply to his letter, that he was convinced of his error, and had published a retraction of his sentiments. No such report ever was propagated by me. When in New-York, in the year 1801, I was informed that he did not relish my reply; and I might have said that he would regret having written any thing upon the subject of the wall; for so powerful is self-love, that few men are pleased with being caught in an error, or with having their opinions publicly called in question, much less with having them refuted.

Thus, in the year 1712, Dr. Cotton Mather, having inspected some large fossil bones and teeth, found at Albany, in New-York, wrote to his friend, Dr. John Woodward, in England, that they belonged to American Giants, whom he supposed to have existed before the deluge, and of whose height he made a calculation.*

Were this gentleman now alive, and were he to behold the skeleton of the mammoth in Mr. Peale's museum in this city, he would be convinced that they were really the bones and teeth of a similar huge quadruped; and he might feel a little mortified that he had ever written to Europe that they belonged to the Brobdignagian biped of the antediluvian world.

An accurate account of this celebrated wall will form an important article in the mineralogical history of this country; and Mr. Lewis will oblige the friends of science by devoting a part of his time to the further investigation of this curious subject.

As he has found out that the stones composing it are not basaltic; that the decomposed granite which embraces it, and of which specimens were brought to Philadelphia by the Rev. Mr. Hall, and one of which is now before me, is nothing but "*sand and gravel;*" he will, perhaps, next discover that the supposed cement with which the sides of it are covered is the plaster of Paris.

If he does, I will believe with him that the wall was built by the antediluvians, to enclose a garden, a prison, or a city, or for any other purpose which he pleases.

I thus, gentlemen, take leave of the wall, and of the Rev. Mr. Lewis; and am, with great respect,

Yours sincerely,

JAMES WOODHOUSE.

* Philosophical Transactions for 1713 and 1714, vol. xxviii. or the Abridgement, vol. v. part 2.

ARTICLE VI.

ACCOUNT *of a* CASE *of* FISTULA LACHRYMALIS; *with Reflections on the different Modes of operating in that Disease: Communicated in a Letter from Dr.* CHATARD, *of Baltimore, (Maryland) to Dr.* MILLER.

HAVING performed the operation for *Fistula Lachrymalis* about eighteen months ago, I now send you some observations on the subject, which you are at liberty to publish in the Medical Repository, if you find them worthy of a place in that work.

Nancy ——, of this city, fifteen years of age, for about a year and nine months had been labouring under a *Fistula Lachrymalis* of the worst kind. When first consulted on her case, I found the eye inflamed; the eye-lids red and thickened; a purulent discharge proceeding from an opening situated on the edge of the orbit, about four or five lines below the straight tendon of the orbicularis muscle; the nostril of that side dry, being no longer moistened by the tears which, in a healthy state, incessantly bedew these parts, but which, in this case, were discharged with the pus from the fistulous opening. My first step was to order an emollient poultice, with a view to lessen the inflammation and thickening, which speedily yielded to this application. As soon as it was in my power to examine the condition of the lachrymal passages, I introduced a probe both by the puncta and the fistulous opening; but found it impossible to get beyond the lachrymal sac. Knowing that, in order to relieve this disease, it was necessary to arm myself with patience, and frequently to repeat and vary my attempts, I inserted my probe, and threw injections into the lachrymal ducts every morning and evening for more than two months, without ever being able to reach the nasal duct, where the cause of the disease undoubtedly was seated. Despairing of success, at length, by this method, I proposed the operation, which was performed in the following manner.

The patient being placed in a chair, and her head drawn back and supported on the breast of an assistant, who held it firmly with his hands, I drew down the lower eye-lid with my thumb and fore-finger, so far as perfectly to distinguish the course of the straight tendon of the orbicularis muscle, and the direction of the lachrymal sac. I then pushed the knife

into the space below the tendon, and made an oblique incision from above downwards, and from within outwards, of the extent of four lines, in which the fistulous opening was included. Then substituting my probe for the knife, I endeavoured, without success, to pass it into the nasal duct, which seemed to me to be firmly obstructed, as it did likewise to two surgical friends who were present at the operation.

I determined to keep open this small wound for forty-eight hours by means of prepared sponge, with the view of partially destroying the obstacle by the supervening suppuration. At the end of that time the operation was again undertaken, with the intention of pursuing the plan of Hunter, if it should prove impossible to recover the course of the natural passages. But I was very agreeably surprised to perceive by my instrument a removal of that obstruction in the nasal duct which, two days before, had existed in such force. Without withdrawing the bistouri, I immediately introduced, by the direction of it, a kind of curved and flexible probe, which I pushed, without much difficulty, into the cavity of the nose, as appeared by the discharge of some drops of blood from the corresponding nostril. The next object was to bring out of the nostril the lower end of the probe, in which there was a small oval opening for the purpose of introducing some threads of a cord intended to form a seton, which was designed to be enlarged every day by the addition of one or two threads, according to the necessity of dilating the canal more or less, until the obstruction should be perfectly removed. In order to accomplish this, I at first took hold of it with a forceps; but it slipped from the teeth of this instrument without being in the least brought down. It immediately occurred to me to place the groove of a director under the end of the probe, and thus to make it slide below the nostril along the course of the director; which completely succeeded, and answered all the purposes of the appropriate instrument of M. Cabanis, called *palettes*. I then fixed the seton by withdrawing upwards the probe armed with the cord, which was confined firmly along the cheek by a strip of adhesive plaster, which also prevented the access of the air. On the next day, and for several following days, the seton was renewed every morning, without occasioning the least pain to the patient, by means of a thread tied to the fresh seton, which I took care to draw from below upwards, in order to prevent any depression or sinking of the lips of the wound. At the end of eight days, the swelling being entirely dissipated, and every circumstance proceeding

as well as could be wished, I attempted, by passing a probe through the upper lachrymal punctum, to reach the cavity of the nose; but for several days my attempt was fruitless. The end of the instrument was constantly stopped at the orifice of the nasal duct, where I discovered an obstruction formed by a fleshy excrescence, which I removed by a small bistouri with a narrow blade. After this, the communication through the lachrymal ducts, and between the sac and the nasal duct, appeared to be free; and I took care to preserve this freedom, by passing a probe, from time to time, through the upper lachrymal punctum, and by causing to pass into the cavity of the nose a fluid injected through that punctum. I ought, however, to observe, that though it was always easy to introduce the probe through the upper lachrymal punctum into the cavity of the nose, the injection often failed to obtain a passage, and wholly regurgitated through the opening in the sac and the lower punctum. I could assign no other reason for this singular fact, than to suppose that the injection, by carrying along in its course a large quantity of purulent matters of different consistence, in some measure obstructed the passage, and thereby created an impediment to any further progress. However this my be, things proceeded in the manner described for more than three months, and at every dressing the seton was found to be covered with a white and well-conditioned pus in the greater part of its extent; though still some dark specks, now and then of larger size, were to be seen in it, so as to leave not the least doubt of the existence of a considerable caries in the part. Different injections of appropriate kinds were successively employed to remove this caries; and, at the same time, the remedies adapted to correct the mass of fluids, such as aperients and evacuants, exhibited in a variety of forms, were not neglected. Finally, after six months of assiduous dressing every morning and evening, I thought it proper to withdraw the seton, which was covered only with the natural secretion of the part; and the ulcer cicatrized without the least deformity in the affected eye, although the lips of this ulcer, towards the end of the treatment, were still sufficiently wide to allow the passage of a seton consisting of twenty-four threads of the ordinary thickness. In the beginning, indeed, I had used one composed of thirty-two threads. This patient, whose cure has now been effected more than a year, has not since experienced any inconvenience other than a slight obstruction of the tears in the upper lachrymal punctum, where they assume a milky colour,

if not wiped once or twice a day, by pressing the finger over the punctum and duct. In all other respects the parts appear in no degree diseased, and it is only by a close inspection that any discovery can be made of an operation having been performed.

Reflections.

The *Fistula Lachrymalis* is a disease by no means rare, and which is too often abandoned to the unsuccessful efforts of nature. Whence does this arise? Apparently from three sources: 1. The patient is apprehensive on account of the delicacy of the affected organ, and is alarmed, as well at the length of time necessary to accomplish a cure, as at the severity of the means employed by some practitioners in the treatment. 2. Whatever may be the method of treatment, the cure frequently fails, or is left incomplete, without the least deficiency in the assiduities or skilfulness of the surgeon. 3. Professional men, who so often find occasion to complain of services ill requited by the public, are unwilling to expose themselves to censure for the trifle of emolument or reputation they can expect to gain from the difficult and doubtful treatment of such cases. Still, however, when we consider the great number of publications on the diseases of the *lachrymal passages*, it seems at first view impossible to resist the belief, that the boundaries of our knowledge on this subject must surely be extended to the *nec plus ultra*. The surgeon, however, who undertakes the task of reading and of operating, will soon perceive that his predecessors have not done every thing for him that might be wished. May I be allowed briefly and explicitly to state my impressions on this subject?

It is clear that there are only two modes of giving relief in *fistula lachrymalis*. It is necessary either to restore the natural passages, or to form new ones to supply their place. Among those who adopt the former plan, we may reckon Anel, Mejau, Petit, Monro, Laforet, Palluci, Pouteau, Le Cat, Louis, Heister, Cabanis, M. Desault, and a great many others. Some among these, such as Anel and Laforet, undertake the cure by probing the lachrymal passages, and by throwing injections into them, with more or less frequency, as well by the puncta as by the cavity of the nose. Others combine with this treatment the use of a cord employed as a seton, which they retain for a longer or shorter time in the lachrymal passages, and assert that, by this means, they are enabled

sufficiently to open the obstructed canal. This method was adopted by Mejau. A third party penetrate into the sac by making an incision in the lower eye-lid, nearly similar to that described in the case before related; but afterwards they pursue a different course to open the nasal duct. Petit employed a grooved probe, with which he forced the obstruction, and which, after this difficulty was overcome, served the purpose of introducing a bougie proportioned to the diameter of the opening. Desault employed a cord of catgut, which, in his opinion, was preferable, because it has the quality of swelling, and thereby dilating the duct in an easy and uniform manner. Other surgeons, after clearing the duct, introduce into it, with the view of its permanently remaining there, a tube of lead, silver or gold, over which they cause the fistula to heal and cicatrize, without perplexing themselves with the unfavourable consequences sometimes resulting from this treatment. My time would not suffice to relate all the numerous varieties of practice recommended by the surgeons who appear as advocates and partizans of the plan of treating this disease by a restoration of the natural passages.

Among those, on the other hand, who have judged it most eligible to form an artificial passage for the tears (and of this number we may mention Voolhouse, St. Ives, Lamorier, Platner, Scabinger, and, above all, the celebrated Hunter), some only undertake to pierce the *os unguis* with the point of a bistouri, and to keep the passage open by means of some foreign body, which they retain there until they judge it might be withdrawn without any risk of the opening closing up; while others broke through that bone, nearly in the whole of its extent, in a variety of modes; or, after the example of Hunter, they removed a piece of the bone by a suitable instrument.

As, from the results of these different modes of operating, it appears that all of them have alike succeeded in certain cases, it is natural to infer that none of them are essentially wrong, and that an appropriate selection is the only question of any importance. I conceive, therefore, that where the fistula is recent, the passages only slightly obstructed, and no callosity or caries has taken place, the method of Anel, Laforet, and Mejau, will succeed. In cases of an opposite description it will be necessary to have recourse to the plan recommended by Petit, Desault, and others. But when, on the contrary, the lachrymal puncta, as well as the common duct, being unaffected, the nasal passage is destroyed by exos-

tosis or otherwise, or the membrane which lines it is become entirely callous, or its opening into the nasal cavity is so closed by adhesion as to be rendered irrecoverable, the treatment advised by Hunter will in such cases alone give relief. And if (supposing even a worse case), in addition to the complicated circumstances above stated, there should be an obliteration of the puncta and ducts, even here it seems probable to me, that, by means of a double operation, a course might still be procured for the passage of the tears. Dr. Anthony Petit, of Paris, in case of the destruction of the lachrymal puncta, while the nasal duct remains free, proposes to make an artificial passage for the tears between the caruncula lachrymalis and the edge of the lower eye-lid, and to make it in such manner, that, after obtaining a cicatrix of this small wound, there may permanently remain an opening sufficiently large for a free passage. In such a case as this, would it not be practicable, at the same time, to open a passage into the cavity of the nose, by removing a portion of *os unguis*, according to Hunter's method, in a direction the most oblique, in order, by that means, to increase the slope of the passage for the tears? To obtain this object appears to me not only to be practicable, but to be exceedingly easy.

Although the tumour of the lachrymal sac belongs not to the subject I am treating, since, properly speaking, it is not a fistula; yet as it has been so considered by some authors, I think it proper to observe, that both experience and reason equally prove that it ought to be managed as the simple fistula, and that if the compression so generally recommended to relieve it hath sometimes succeeded, it ought still to be regarded as only a secondary means, and merely adapted to restore to the sac the tone lost by excessive distention. This compression, for instance, would be quite useless in that kind of tumour of the sac observed by M. Petit, the surgeon, which is not diminished by pressure, but which remains hard, and makes constant resistance to the finger. That surgeon supposes this tumour to take place in consequence of violent inflammation, which has had the effect of obstructing, at the same time, the lachrymal puncta and the nasal duct. The tears, then, contained in the lachrymal sac are sufficient to form this tumour, which will remain free of pain as long as they undergo no morbid change; but when they suffer degeneracy, and excite inflammation in the sac, a fistula may then take place, which will be more or less difficult to cure, in proportion to the obstacles to be encountered in the restora-

tion of the lachrymal passages, if, indeed, it be practicable to accomplish it. But it is plain that, except the falling of tears over the cheeks, the disease may be relieved; since, for this purpose, it is only necessary to convert this fistula into a simple wound.

In this brief analysis of the different methods adopted by surgeons, I have designedly omitted to give the preference to any one; though I admit that all do not combine the same advantages. The understanding of the surgeon ought to modify his procedure according to the circumstances of the case; for it is a fact, that he will rarely operate twice in precisely the same manner. This was the opinion of the celebrated Desault, whose loss France will long have occasion to lament. And I can declare that, during three years which I passed in studying surgery under that great master, I saw him constantly varying his mode of treatment; so many resources and such facility of accommodation, had he in his creative mind!

After the account now given of the various treatment of this disease, I leave it to every one to make his remarks on that which I adopted. It may be thought that my repeated incision was unnecessary; that the probe with which I opened the nasal duct, and which is nearly like that used by Monro, would be apt to lacerate the sac, and produce dangerous inflammation; that it is difficult to withdraw it from the nostril, and, indeed, impossible in cases where the opening of the duct into the cavity of the nose is diseased in a manner sometimes observed; that the seton I used was too large; and that, by passing it through the wound, I occasioned an irregular and deformed cicatrix. To all this I have but one answer to give: I did what appeared to me to be my duty: on another occasion I shall, perhaps, act conformably to the opinion of the objector, by pursuing my own, and by attending to the indication of the moment. If, in the case above related, I have not restored the organ to its natural state, it is because it was, perhaps, impossible, entirely to do so; or that, in order to accomplish it, it would have been necessary, after the cure of the fistula, to inject the superior lachrymal duct continually for several months, and to pursue the plan of Mejan in all its extent. But the want of time on my part, the loss of it to the patient, already fatigued by the tediousness of the treatment, and the possibility that nature, occasionally assisted by gentle compression, might complete the rest, determined me to content myself with having freed my patient from an

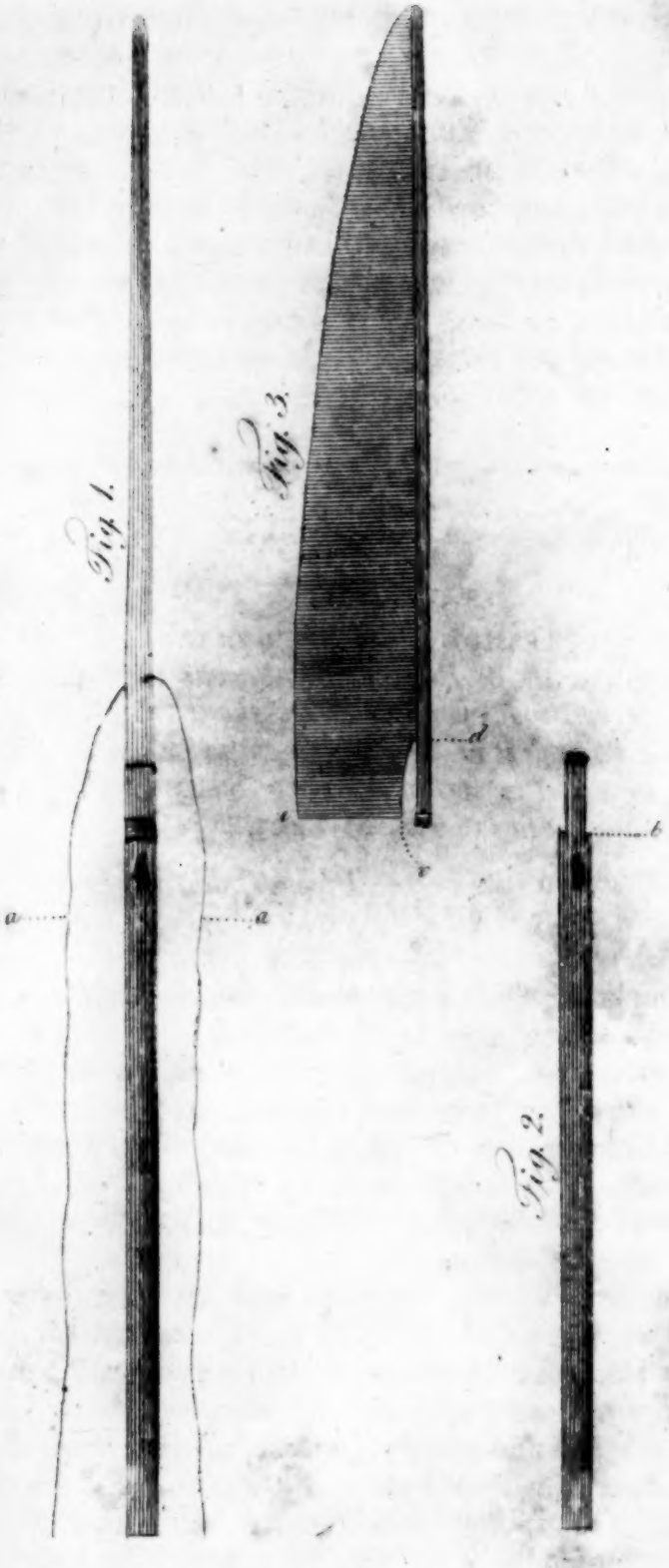
Fig. 1.
Fig. 3.
Fig. 2.
a
a
d
c
b

ulcer, which, to say nothing else, exceedingly disfigured her. And, finally, if by pointing out what I have done, and, perhaps, ought to have done, in order to obtain complete success, I can awaken the attention of my younger professional brethren, excite their emulation, and contribute any thing towards enhancing the good they may accomplish in similar cases, I shall flatter myself with the hope of having, in some measure, fulfilled the duty which every practitioner ought to feel incumbent on him, that of being useful to the profession, even although his exertions to be so should be made at the expense of his self-love.

ARTICLE VII.

CASE *of* SUPPRESSION *of* URINE, *in which a Gum-Elastic Catheter, with a Bougie-Point, was used with Success: together with Experiments on the Treatment of Gum-Elastic by Spirit of Turpentine and Ether: Communicated in a Letter from* PHILIP SYNG PHYSICK, *M.D. of Philadelphia, to Dr.* MILLER.

Philadelphia, July 26, 1803.

DEAR SIR,

IN compliance with your request, when I last had the pleasure of seeing you in Philadelphia, I send you a short history of a case of suppression of urine, in which a gum-elastic catheter, with a bougie-point, was used with success. To this I have added an account of the result of some experiments made with elastic gum, by which I hope a method is pointed out of using that substance in the formation of catheters, bougies, &c.

A middle-aged man was admitted into the Pennsylvania hospital in the winter of 1795-6, on account of a fracture of both his legs. The patient being laid on his back, the usual dressings were applied. No uncommon complaint was made until the afternoon of the second day, when I was informed that he had not been able to void any urine since the accident. On visiting him in the evening, I found the bladder so greatly distended as to form a considerable tumour in the hypogastric region, and the poor man in great distress. An attempt had been made to relieve him with a silver catheter,

but it could not be passed into the bladder. I endeavoured immediately to introduce a common sized bougie, but was unable to pass it beyond the bulb of the urethra. A gum-elastic catheter was next tried, with no better success. The bougie was again had recourse to, and by bending the point of it to one side, I was enabled to pass it beyond the obstruction, and into the bladder. I allowed it to remain some minutes in this situation, in hopes that, when it was withdrawn, the urine would follow it; but in this I was disappointed, and therefore attempted immediately to enter a gum-elastic catheter, but was not able to pass it beyond the obstruction at the bulb of the urethra. Under these circumstances I determined to cut off the end of a gum-elastic catheter, and tie on it two inches of the end of a bougie, because the flexibility of the bougie enabled me to bend it in the proper direction, which could not be done with the catheter. The instrument thus formed was passed into the bladder with care, and the urine entirely drawn off. The patient was afterwards relieved with this instrument twice every day for a fortnight, after which he became able to void his urine without assistance.

I have since had several cases in which it has been necessary to employ this instrument; and Dr. Wistar, to whom I showed it, has informed me that he has also met with several instances of suppression of urine in which he was successful with it, and in which, had it not succeeded, he would in all probability have been under the necessity of tapping the bladder. For a more particular description of the instrument see the annexed plate.

It has been long since known that elastic gum may be rendered very soft by spirit of turpentine, and that it can be dissolved in it by the assistance of heat; but it has been observed, on evaporating the turpentine, that the gum loses, in a great degree, its elasticity, and on handling it sticks to the fingers.

After a number of experiments, which I shall not relate because they were unsuccessful, I found that, by immersing it in vitriolic ether after the action of the spirit of turpentine, its original properties were regained. By exposure to the air, the ether evaporates, and leaves the gum in its original state. I have observed, however, that when the gum-elastic is dissolved with the assistance of heat in spirit of turpentine, it cannot be restored to its former state so perfectly as when it is made into a paste without heat. When gum-elastic is im-

mersed in spirit of turpentine, it is unequally affected by it: at the end of two or three days some portions will be found very soft, and others remain more firm, so that it cannot be spread evenly over a surface: by rubbing it, however, on a marble slab, most of these solid portions can be broken down; and by straining it through fine linen, a paste of gum-elastic can be obtained of equal consistence. This paste may be used for the construction of catheters, &c. either by itself, or it may be applied over catgut or silk, wove by the whip-makers into cylindrical tubes. If the paste be made with spirit of turpentine, prepared as below mentioned, it will become dry by exposure to the air for a few hours, when another layer may be applied, and this may be repeated until the instrument is sufficiently covered with elastic gum; after which it may be immersed in ether, and then dried.

Supposing that it might be possible to render the spirit of turpentine more pure by re-distilling it, and thereby, perhaps, to evaporate the whole of it from the gum-elastic, I had some prepared by distillation from quick-lime. This was very limpid, acted quickly on the gum, and the paste formed with it, when spread out on linen, dried completely in about six hours. The gum was left free from stickiness, and possessed its former elasticity. Much to my surprise, however, at the end of thirty hours it became in a slight degree sticky, though it retained its elasticity. Perhaps, if the spirit of turpentine were distilled two or three times, it would be depurated in such a manner as to leave the elastic gum in a more perfect state, and enable us to apply it to different uses, without being under the necessity of using ether.

I am, dear Sir,
Yours sincerely,

PHILIP SYNG PHYSICK.

EXPLANATION OF THE PLATE.

Fig. 1. Represents an elastic-gum catheter, with the bougie-point fixed on its extremity. *a a* A strong thread passed through the bougie, so that if, by any accident, it should slip off from the end of the catheter, the surgeon may be enabled to withdraw it.

Fig. 2. The catheter, with the end cut off, and some of the external coating of the extremity scraped away to *b*, preparing it to receive the bougie.

Fig. 3. A piece of bougie plaster, one side of which is to be rolled up until it is large enough to fill the bore of the catheter, into which the part below, *d*, is then to be inserted; having previously made the slit *c d*. The formation of the bougie is then to be completed by rolling the remainder of the plaster. The flap *c d e* will be rolled round the outside of the end of the catheter from which the coating has been scraped, and may be tied there with a piece of waxed thread.

REVIEW.

ART. I. *Papers on Agriculture; consisting of Communications made to the Massachusetts Society for promoting Agriculture. Published by Order of the Trustees.* 8vo. pp. 93. *Boston.* Young & Minns. 1803.

GRADUALLY we discover the spirit of cultivation extending its beneficial dominion over our land. More and more attention is bestowed upon the collection and arrangement of facts. Utility and economy guide the minds of our agriculturists, and lead them (far from the labyrinths of speculation) along the plain paths of practice.

> " Quid faciat lætas segetes; quo sidere terram
> " Vertere—ulmisque adjungere vites
> " Conveniat: quæ cura boum; qui cultus habendo
> " Sit pecori; atque apibus quanta experientia parcis"—

are as worthy subjects of inquiry now as they were when Virgil wrote his admirable Georgics.

Agriculture is the great occupation of our citizens. They are spread over a vast surface of earth, and engaged laboriously in its tillage. That ancient and excellent employment is more conducive than perhaps any other to virtue, independence and patriotism. All our strength and our hope resides with the steady, honest and hardy yeomanry of our country. Theirs may be deemed the most important of terrestrial occupations; for, from their productive industry are food, fuel and clothing derived to the human species. And from the same source are many manufactures supplied with their crude materials, and commerce furnished with a large proportion of her imports and exports.

The details of an occupation so extensive and various as agriculture, are almost endless. It embraces an immense field of physical experiment and research. The choice of soils, and the fertilization of them when exhausted, are of themselves great subjects of inquiry. The selection of plants proper for being reared to the best advantage in each soil and climate, is another matter of nice discrimination. The due attention to the fitness of a farm for the vine or for tobacco, for cotton or for indigo, for hemp or for lumber, for grass

or for bread-corn, requires much judgment and care. Indeed, the natural and economical history of every species of vegetable or animal raised upon a farm, might occupy a memoir or a volume by itself. But instead of writing an eulogium upon agriculture, it is time for us to proceed with the work which lies before us.

We observe that CALEB STRONG, the Governor of the State, is the President of the society, and JOSEPH RUSSELL and Professor DEXTER the Vice-Presidents. JOHN AVERY, Esq. and the Rev. Dr. PARKER are the Secretaries; and Messrs. AMES, BRIMMER, CABOT, KIRKLAND, LYMAN and WARREN, are the Trustees. THOMAS L. WINTHROP, Esq. is the Treasurer. We observe a list of about two hundred and twenty ordinary, and of thirty-eight honorary members. The fiscal affairs of the society seem to be well attended to, for we see a regular abstract of the treasurer's accounts; and the annual income, which appears to amount to more than seven hundred dollars, is appropriated judiciously in offering premiums for the following subjects, which we extract entire.

"1. To the person who shall discover an effectual and cheap method of destroying the canker-worm, and give evidence thereof, to the satisfaction of the trustees, on or before the first day of October, 1803, a premium of *one hundred dollars*, or the society's gold medal.

"2. And a premium of *one hundred dollars*, or the society's gold medal, to the person who shall, on or before the first day of December, 1803, discover an effectual, and the cheapest method of destroying the slug-worm, and give evidence thereof to the satisfaction of the trustees.

"3. An annual premium of *thirty dollars* for each year previous to 1805, to the person who shall introduce into the State of Massachusetts a ram or ewe for the purpose of propagating a breed of sheep superior to any in the State at the time they are so introduced. If from a foreign country *fifty dollars*. Claims to be presented on or before the 1st of October annually.

"4. To the person who shall produce the largest quantity of wool, meat and tallow, from the smallest number of sheep (not less than one score), raised on his own farm, a premium of *thirty dollars;* to be claimed on or before the first day of August, 1804.

"5. To the person who shall, in one year, by a method new and useful, or that shall be an improvement on the me-

thods already practised, make the greatest quantity of compost manure in proportion to the expense; to be of a good quality, and composed of materials common to most farms; the quantity to be at least two hundred tons; and the claim to be accompanied with a description of the yard or place, and the mode in which the same is made; a premium of *fifty dollars*, or the society's gold medal. And for the next greatest quantity, being not less than one hundred tons, *thirty dollars*. Claims to be presented previous to the 1st of August, 1803.

" 6. To the person who shall show, by actual experiment, on not less than two acres, to the satisfaction of the trustees, a new or improved, being the best and cheapest method, of introducing fine grass, fit for hay or pasture, into low fresh meadows, now producing coarse wild grass, or bushes, a premium of *thirty dollars*. Claims to be presented before the 1st of November, 1804.

" 7. To the person who shall discover any species of grass, not commonly cultivated or known, of a quality for the food of neat cattle or horses, equal or superior to those now in use, *fifty dollars*. Claims to be presented on or before the 1st of October, 1804.

" 8. To the person who shall exhibit distinct specimens of the greatest variety of grasses in general use, and specify, to the satisfaction of the trustees, their respective qualities, productiveness, and usefulness as food for different kinds of animals, a premium of *fifty dollars;* to be claimed on or before the 1st of October, 1803.

" 9. To the person who shall produce, from seed, the best growth of thrifty trees, not less than 600 in the whole, and in the proportion of 2400 to the acre, of any of the following kinds of forest trees; viz. oak, ash, elm, sugar-maple, beech, black or yellow birch, chesnut, walnut or hickory, *twenty-five dollars;* if all of oak, *fifty dollars*. Claims to be made on or before the 1st of October, 1806.

" 10. To the person who shall ascertain, by accurate analysis, the constituent parts of several fertile soils respectively, and in like manner the parts of several poor soils, and thus shall discover the defects of the latter; and shall show, by actual experiments, how the said defects may be remedied by the addition of earths or other ingredients which abound in the country, and in a manner that may be practised by common farmers, *fifty dollars*. And if it shall appear, to the satisfaction of the trustees, that, upon an extensive practice,

the improvement of the poor soil would be more than equivalent to the expense of the improvement, the addition of *one hundred dollars.* A minute description of the several soils, and all the circumstances attending the processes, cultivation and results, will be required. Claims to be made on or before November, 1804."

Among the papers we find the two on preventing the decay of peach-trees, which we reprinted from the Philadelphia Transactions, in our sixth volume, p. 186—188. There they may be read. We discover also a sensible and practical abstract of Mr. Forsyth's method of managing fruit-trees. They who have not this writer's original work may here find the substance of his directions about pear-trees, orchards, gathering apples and pears; on the canker and gum; together with his directions for curing diseases, defects and injuries in all kinds of fruit and forest trees, and the method of preparing the trees and laying on the composition. In this collection also we are glad to see two valuable communications rescued from the fugitive and perishable columns of the newspapers: we mean Mr. Barrell's mode of saving nineteen-twentieths of the quantity of seed-potatoes, by carefully cutting out the eyes for planting, and Col. Humphreys's account of the Merino breed of Spanish sheep. Mr. Humphreys was presented with the society's gold medal for having introduced this breed of animals into the country on his return from Madrid.

There is a learned and elaborate essay, which particularly attracted our attention, *on the benefit of stripping the bark from the trunks of trees.* This is written by a member of the Kennebeck Agricultural Society, and if our conjecture is right, it possesses the air and manner of B. Vaughan, Esq. The ingenious and respectable author was led to this inquiry by reading the account of the decortication of apple-trees in our third volume, p. 420, and the remarks thereon in our fourth volume, p. 104. To these we refer our readers. In addition to the information there given, and to much more which Mr. Vaughan has collected from the writings of Fontenelle, Du Hamel, Senebier, and others, he assures the society that the very violent and hazardous practice of stripping off the bark has not uncommonly been applied, of late years, in certain orchards in several parts of New-England. "It is true," he continues, "that this remedy occasionally fails, either from defect of care in the operator; from too great weakness, or the want of a sufficient age in the tree; from a wrong season, or unfavourable weather, being chosen for the operation; or

from some other cause yet unknown to us. But, in several instances, whole orchards have been thus treated, with apparent safety to the trees, and satisfaction to the proprietor. I have myself seen a young apple-tree, in the town of *Hallowell*, which, on account of some defect, was stripped of its bark, about ten years since, in the longest day of June, and which still lives and bears fruit. Two other apple-trees, in the same orchard, underwent the same treatment, about the same period; but this tree more particularly attracted my notice, on account of *marks left in the new bark*, in consequence of the finger having passed along the slime covering the sap-wood, after the removal of the original bark. The new bark on all these trees is remarkably smooth, and resembles the bark on very youthful plants."

In further corroboration of the safety and utility of laying bare the trunks of trees by peeling off their bark, he gives an account of the cork-tree, which bears the operation well for a long course of time. (p. 11.)

"The cork-bark (says M. Bomare) splits of itself, and will even separate from the tree without assistance; being pressed and driven off by the circular growth of the tree within; that is, by another bark formed under it, which is red, and which may be discovered at a considerable distance. When the inhabitants wish to gather their first crop of cork-bark (which is produced by trees from twelve to fifteen years old) they wait for *hot and fair weather;* for if it should rain immediately afterwards, the young bark underneath would soon be spoiled, and the tree itself be in danger of perishing. The weather then being favourable, they make cuts in the tree lengthways, in order the better to handle the bark. They do not perform a second operation till after an interval of six or eight years; but thenceforward they repeat it, at like intervals, during the course of a *century and a half*, without finding that this frequent successive removal of the bark causes any inconvenience to the tree. On the contrary, the bark of old trees is the best; nor, indeed, does it become very good till after the third gathering. *(See Bomare's Dictionnare Raisonne d'Histoire Naturelle*, art. *Liege Suber.)*

"When the cork-trees (says Mr. Townsend) are fifteen years old, they begin to be productive, yet not for the market; this maiden bark being only fit for fuel. At the end of eight years more the bark improves, but does not arrive at its perfection till the third period; after which, for 150 years, it yields a marketable commodity every ten years. The sea-

son for barking is in July or August, when they take special care not to wound the inner bark! *(See a Journey through Spain, by the Rev. Joseph Townsend,* vol. i. p. 91, 92.)

" Baron (John Talbot) Dillon asserts, that the country about Monasterio (which is seventy miles north of Seville, in Spain) ' abounds with a great many cork-trees, from which they strip off the bark every four years, as far as the white sap (the alburnum) which they leave on the tree. A liquid humour afterwards issues out again,' he adds, ' which thickens with the sun and air, and forms a new bark in about four years more.' But the Baron's usual guide, Mr. Bowles, according to his own statement, affirms, ' that every four years they peel off the bark *as far as the epidermis.*' Whether we are to understand that this *epidermis* is the outer-side of the *new* bark spoken of by Mr. Bomare, or that the word epidermis is here employed by mistake; still we learn that a bark was removed periodically. Perhaps these periods differ in different places, and perhaps there may be different kinds of the cork-tree. *(See Travels through Spain, by Baron Dillon,* 4to. second edit. p. 304.)

" Miller, in his *Abridged Dictionary,* asserts, that there are two or three varieties of the cork-tree; all which, with Columella, the Linnæan school, and other authorities, he ranges under the *oak* (quercus). His account is as follows, and it will be the last cited here: ' The exterior bark (of the quercus suber) is the *cork.* This is taken from the trees every eight or ten years; but there is an *interior* bark which nourishes the trees; so that the stripping of the *outer* (bark) is so far from injuring them, that it is *necessary to continue the trees;* for those whose bark is not taken off seldom last longer than fifty or sixty years in health; whereas, the trees which are barked every eight or ten years will live one hundred and fifty years or more. The bark of the young trees is porous and good for little: however, it is necessary to take it off when the trees are twelve or fifteen years old, without which the bark will not be good, and after eight or ten years the bark will be fit to take off again. But this second peeling is of little use; but (in) the third peeling the bark will be in perfection, and will continue so for many years; for the best cork is taken from the old trees. The *time of year* for stripping off this bark is in July, *when the second sap flows plentifully.* This is performed with an instrument like that used for disbarking oaks.' (See his article *Quercus.)*

" But enough for the present of these accounts of the cork-tree.

"It may even be thought, that statements concerning a tree supposed to have a double bark will as little apply to trees with a single bark, as conclusions respecting serpents, which habitually shed their skins every year, will answer for other animals to whom this faculty is denied

"But, in effect, we are not sure that what happens to the cork-tree may not happen, in an inferior degree at least, to some other trees. The season, also, chosen for operating upon the cork-tree, seems to mark at least *one* season for attempting the same process with other trees. This season is the one in which the sap is conceived to be in its second *flow*, and prepared to form the *mid-summer shoot* in various trees. We may be encouraged, also, from the example of what occurs to the cork-tree, to endeavour, in certain cases, to *renew* the great operation in question upon other trees, upon which it has *already been once performed.* In the case of the cork-tree, we are told that the repetition of this process is even friendly to the durability of the tree."

This piece deserves the attention of all nursery-men, gardeners, and improvers of estates.

There is another excellent memoir, by the same hand, on the *means to be employed for increasing, by cheap and easy operations, the strength and durability of timber, and for enlarging the dimensions of the same.* (p. 23). The experiments made by Buffon and Du Hamel, while employed in researches of this kind by the government of France, are recited. The object of these is to prove how timber may be improved to a very high degree of excellence, by girdling the trees in such a manner that they may be several years a dying; or, in other words, that a lingering life may be retained in them during that time. And after giving a clear and candid analysis of the published memoirs of these two distinguished men, and of the opinion of the celebrated Mr. Evelyn on the benefits to be derived from treating trees in this way, he offers the ensuing remarks of his own. (p. 39.)

"1. The *outer* circles of the wood in all trees being largest, and therefore containing most timber, the increase of timber, by the methods here described, falls upon the outer, that is, upon the largest circles of the tree. This consideration will remove all doubt as to the accuracy of the computations in M. Buffon's memoir.

"2. These contrivances, by hardening the outer wood, may lessen the quantity of *offals* from timber, and therefore tend to diminish the expense both of labour and of carriage.

"3. If timber can be hardened on *foot*, according to the French phrase, that is, as it stands, it may be *removed* at that season of the year which is most convenient for cutting it down and transporting it.

"4. If timber, also, can be seasoned as it stands, it will suffer little from *wet*, which injures other trees left to be seasoned in the open air.

"5. The expense of buildings, of docks, and of other apparatus for the seasoning of timber, with the stagnation of capital during the period of its seasoning, may be spared, if it be true that timber can be properly seasoned, while standing in the woods, by the methods above proposed.

"6. If these methods have, in truth, the good effects thus attributed to them, they may, in some degree, render needless the dispute as to the *season of the year proper for felling certain timber trees.* Some uncertainties which have existed on this subject may be seen in M. Du Hamel's account of the contradictory practice prevailing respecting it in his time, in different countries. It may be curious to observe, that in our day, Mr. Snodgrass, the surveyor of the shipping in the East-India Company's service (than whom no man, perhaps, has seen and heard more on the subject, as far as concerns England and the East-Indies), is in favour of English timber which is *winter-fallen.** Indeed, the question may admit of different decisions in different countries, especially as relating to trees of different species and of different ages.

"Against all these advantages, we must not admit it as any objection, that hard timber is also hard to work; for, upon this principle, none but soft woods ought to be employed in work: in other words, to reduce the first cost of the work, we must sacrifice all the attention due to use and to durability.

"But it is time to make a remark applicable to the United States. It is this:

"Discussions concerning the improvement of timber are peculiarly important in a vast continent possessed of wildernesses of woods, for the timber of which more extensive

* "See his Letter to Mr. Dundas, with an appendix, printed in 1797, p. 49; in which are many valuable facts for ship-builders. Out of 989 vessels built or repaired under his inspection in 37 years, only one had foundered; while in the British navy above sixty vessels are supposed to have foundered in nine years (from 1775 to 1784.) M. Du Hamel ridicules the idea of attending to the falling of timber in particular periods of the *moon.* (See b. iii. ch. 5.)

markets would offer, were it in better repute for strength and durability. An *increase* of exportable timber would lead to an increase of freights and of seamen; at the same time that an improvement in the *qualities* of timber would add to the calls for ship-building, and be highly serviceable to domestic carpentry. These considerations will derive new weight from recollecting that the American woods contain a profusion of *large trees*, the chief of which are not only destitute of the solidity belonging to trees found in pastures; but, by being drawn up in consequence of having grown in company, acquire long trunks with few branches, so as to admit of being disbarked with ease up to the true height.

"To *what* heights in the stem, in different species of trees, and at different ages, and under different circumstances, this disbarking may be carried, is to be decided by actual trials. It seems reasonable, however, to presume, that so much of the upper part of the tree ought to retain its bark, as shall be necessary for procuring to the part which is disbarked its due supply of sap."

We recommend this paper to all our carpenters, shipwrights, and naval as well as rural economists.

We read with pleasure the experiment of Col. Robert Dodge (p. 47), on raising forest trees from the seeds. When the reader learns that this gentleman had reared from seeds of his own planting three thousand six hundred and forty-two trees, of three and four years old, and that these were oaks, shag-bark walnuts, oil nuts, chesnuts, elms and white-ashes, he will, in all probability, conclude with us, that the society's premium of one hundred dollars was properly adjudged to him. As the consumption of wood, in almost all our settled country, so much exceeds the annual growth, we heartily wish there were more pains taken to propagate trees for ornament, shelter, fuel and timber. Col. Dodge has set an example amply worthy of imitation.

Mr. Bullen's method of raising trees, by cutting down all the standing timber of a lot of woodland at once (p. 50), and suffering all the young scions, &c. to take an even start, and grow up together, is judicious; and we are pleased to see farmers, in many places, adopting so prudent and profitable a plan.

An experiment, made by Mr. Justin Ely, on raising the early variety of Virginian wheat (p. 71); and an essay on the benefit of frequent ploughings, by A. C. (p. 78), are respectable performances, and evince skill and intelligence in their respective writers.

We have just to add our hope, that after so auspicious a beginning, this useful society will not terminate its labours here, but continue to collect and to publish whatever may have a tendency to cultivate the minds of our land-holders as well as their fields. And, indeed, when we reflect how frequent it is that the former are quite as rough and barren as the latter, we entertain an expectation that, as far as the influence of this association extends, there will be applied a due degree of *clearing* and *dressing* to both these great departments of human improvement.

ART. II. *Elements of Botany; or Outlines of the Natural History of Vegetables. Illustrated by thirty Plates. By* Benjamin Smith Barton, *M. D. Professor of Materia Medica, Natural History and Botany, in the University of Pennsylvania.* 8vo. *Philadelphia. Printed for the Author.* 1803.

SEARCHING for the number of sheets in this bulky volume, we found it to consist of a preface of twelve, of a first part of three hundred and two, of a second part of thirty-two, of a third part of one hundred and sixty-eight, and of an appendix of thirty-eight pages, exclusive of the plates, making in the whole five hundred and fifty-two pages of letter-press.

To these are added a score and an half of engraved illustrations, which at once explain the science and embellish the work. These invited our early attention, and won our approbation on several accounts; for they are, for the most part, selections of plants, or their parts, to explain the principles of botany, which are not copied from other books, but delineated from their native situations. Taste and judgment have directed the choice of the species which should be introduced; and the principal of these, besides subserving the purpose of mere elucidation, are remarkable for their rarity, their beauty, their peculiarity, or some other quality. The drawings are correct, natural and easy, and the engravings are handsomely executed. Both are in a style well befitting the respectable publication of which they form an important division. But more especially it delighted us to behold the vegetables of our own country transplanted into this garden, where their leaves will not be nipped by frosts, and their blossoms will never fade. The picturesque appearance of the *purple side-saddle flower*

(Jarracenia purpurea) renders it a very striking subject for a frontispiece, and enables it to appear to great advantage in contrast with the humble Craneberry (Vaccinium macrocarpon) which trails along beneath. The *Painted-cup* also (Bartsia coccinea) makes a beautiful print, representing its gay singularities. New-York bestows her delicate *Cucumber-root* (Medeola virginica), her savoury *Mandrake* (Podophyllum peltatum), and her elegant *Tamarisk* (Pinus pendula), for the purpose of forming an elegant flowery wreath. Indeed, we see Pennsylvania offering her *Star of Bethlehem* (Hypoxis erecta), her *Cassia* (Marilandica), and her *Passion-flower* (Passiflora incarnata), with a similar intent. From her ancient dominion, Virginia collects, among others, her *Rhexia* (Virginica), her *Philadelphus* (Inodorus), and her *Tobacco* (Nicotiana), and joins them to this variegated garland. The *Fly-trap of Venus* (Dionæa muscipula), the greenish *Canna* (Glauca), and the yellow *Xanthoriza* (Apiifolia), are presented by Carolina, with a request that they may likewise be added. Georgia sends her *Robinia* (Viscosa), her *Amaryllis* (Atamasco), and her cluster of *Æsculuses*, with a like desire; while, from beyond the northern extreme of Fredon, Canada hands along her *Collinsonias* and her *Lillies;* and from a territory more remote than its southern frontier, Florida stretches out her *Convolvuluses*, earnestly expressing hopes that those flowers may be entwined with the rest. These, and various others, scarcely less deserving of enumeration, would form, we will not fancifully say, a bouquet worthy of being placed on the bosom of Flora, or either of her blooming nymphs, but a crown eminently honourable to the temples of that American who first gave to his country an elementary work on Botany.

In delivering his doctrines, Professor Barton imitates, and, indeed, transcribes many things from the "Swedish sage." How could it be otherwise for one who adopts the sexual system of plants, and a great part of the Linnæan nomenclature? But though he treats his great predecessor with profound respect, he does not implicitly follow him. On the contrary, before the reader has proceeded far beyond the threshold of the work, he is informed (p. 11), "that Linnæus is not always consistent." Soon after (p. 20) the student is cautioned against "being misled by the specious language of the illustrious Swede." Afterwards (p. 85), his definition, that the glandula "is a fulcre secreting a liquor," is affirmed by Dr. B. to be *unmeaning and intolerable.* Then, again, he proceeds a greater length, and prints with capitals, in p. 144, that "the sexual

system of Linnæus cannot be immortal. It will, at some future period, be deserted for a system more agreeable to the scheme or intentions of nature." In another place (part iii. p. 49), he expresses his opinion, that the sexual system would not suffer any injury by the total abolition of the eleventh class, or Dodecandria. In part iii. p. 105, the Swede is charged with having *most monstrously* asserted to his pupils, that, excepting the liquorice, there was hardly one medicinal article in the order of the Papilionaceous plants; when, at the same time, the remedial qualities of several others were known. On the last order, the Monogamia, of the nineteenth class, or Syngenesia, the author echoes a severe criticism of Dr. Milne, on the violence done to nature by Linnæus "in tearing many genera of plants from their proper place, and incorporating them with others, which are of a different, and even of an opposite nature." (Part iii. p. 116.) Of the order Gynandria, in the twenty-first class, or Monoecia, Dr. B. declares he is at a loss to understand the Linnæan disposition, and cannot believe Linnæus understood it himself. (Part iii. p. 153.) Though he does not agree with Thunberg and his followers, that botanical arrangement has been improved in any degree by the reduction of the three Linnæan classes of Gynandria, Monoecia and Dioecia, yet he coincides with Dr. J. E. Smith in the propriety of suppressing entirely the Polygamia, "as a bad and unnatural class, variable and obscure." (Part iii. p. 135.)

In the first part of his book Professor B. has given, in very considerable detail, what may be termed the description of vegetables. This comprehends a full account of all the parts of which they consist in due order, with the technical and appropriate names belonging to each. As the knowledge of these is essentially necessary to make a botanist, the author begins with the root, and proceeds with minuteness and patience—*ab ovo usque ad mala*—through all the variety of the herb and bud, to the different organs of fructification. In the course of this copious inquiry, he takes the *Philosophia Botanica* for his guide. And we are very glad to find the substance of that foreign work so intelligibly and spiritedly paraphrased or translated into our own tongue. But the manner of doing this is different from that which we find in the abstracts and imitations of Lee and Rose. Dr. B. has interspersed the volume extensively with his own observations, and with facts collected by himself: and these are so carefully interwoven with the other materials, that they give a finished

and embroidered appearance to the whole tissue. To enable our readers to entertain an exact idea of our meaning, we lay before them our author's remarks on the natural history of roots (p. 17).

"1. The roots of the greater number of vegetables are hid below the surface of the earth, and from its bosom they derive a large part of their nourishment and growth. But there are many vegetables which are not thus necessarily attached to the earth. The Misletoe, the Vanilla, the Dodder, the Hypocistis, and many others, do not emit their radicles into the soil, but migrate, if I may use the phrase, in search of nourishment elsewhere. They attach themselves to other plants, which they use as fulcres or props, and from which, it is highly probable, they derive *some* of their nourishment. Such plants are denominated *Plantæ Parasiticæ*, or *Parasitic Plants*. This term was, long ago, employed by the celebrated Malpighi. Linnæus makes much use of it, and he has not forgotten, in his employment of it, to glance severely at the close-clapsing habits of some botanists, his contemporaries, and aspiring rivals after glory.

"The Misletoe, the Vanilla, the Tillandsia, and many others, attach themselves to the branches of trees. The Asarum Hypocistis shows a preference to the roots of plants, particularly, it is said, the Cistus, or Rock-rose: whilst different species of Cuscuta, or Dodder, cling to the stems of a great variety of plants.

"The parasitic plants attach themselves to other plants in various different ways. The seed of the Dodder having been deposited in the gound, there makes its first effort towards vegetation. It protrudes a stem, which seizes upon the first plant in its vicinity, to which it closely adheres. It is imagined that it derives its nourishment, by means of certain glandular organs, from the supporting plant. It is observed, however, that the lower part of the stem of the parasitic soon dries up, the root perishes, and the parasite lives upon its fulcre, or support. Perhaps, however, it is not certain, that it derives any essential part of its nourishment from the juices of the plant to which it attaches itself. It is highly probable, that, in many instances, parasitic plants injure their supporters more by emitting from their bodies some noxious fluid, than by absorbing wholesome fluids from the supports.*

"* The Cuscuta Americana, or American Dodder, grows very abundantly in Pennsylvania, and other parts of the United-States. It clings to

"The Misletoe, the Vanilla, the Tillandsia, and the Hypocistis are never found upon the earth: they appear to have been originally produced upon the vegetables by which they are supported. The two first mentioned parasitic plants extend their roots under the bark, and even pierce the body of the wood. The Tillandsia usneoides, which is well known in North-America by the names of Long-Moss, and Spanish-Beard, is much more loosely attached to the trees of the forest. This parasite is so abundant in the southern parts of the United States, and in New-Spain, that it even communicates a melancholy darkness to extensive woods.

"2. The roots of many mosses attach themselves to the firm barks of trees, whilst the lichens cling to the hardest stones. Some species seem especially attached to stones of a calcareous nature; whilst others form a beautiful plating, as it were, upon the surface of whins, sand-stones, and never-dying granites. It has not yet been determined, with absolute certainty, from whence these latter mentioned vegetables derive their nutriment. It cannot be from the stony substances to which they are attached. It is probable, that they are nourished entirely by the atmosphere, and by water and other extraneous bodies which the atmosphere contains.

"3. Some plants swim upon the water, and even perform pretty extensive migrations. Different species of Lemna,* or Duck-meat, swim upon the surface of the standing waters of Europe and North-America, and when not disturbed will cover the whole surface. Such plants cannot, with propriety, be said to be fixed to a certain spot. They are, indeed, furnished with radicles, or roots, but these hang loose in the water, from which, it is probable, they derive their principal nourishment. But the Fuci, or Sea-wreck, an extensive tribe of plants, perform migrations of hundreds of miles upon the ocean, where the eye of the navigator is often enlivened with extensive fields, which are principally composed of these vegetables.

"4. Of the many thousand species of plants that are now known to the botanists, by far the greater number are, unquestionably, furnished with roots. Some plants, however, are said to be wholly destitute of roots. Such are the different species of the genus Tremella, which have so many of the ha-

a great number of species of plants, and I am not certain, that it is found more frequently upon one species than upon another. This plant is known by two very different names, viz. Love-vine, and Devils-gutts.

* "Lemna gibba, L. minor, L. trisulca, and L. polyrhiza.

bitudes of animals, that, by certain writers, they have been considered as belonging more properly to the animal than to the vegetable kingdom.

" 5. According to Linnæus, the root is made up of *Medulla*, or Pith; *Lignum*, or Wood; *Liber*, or Inner Bark; and *Cortex*, or Outer Bark. These several parts will be more particularly mentioned, when I treat of the anatomy of vegetables.*

" 6. Linnæus, ever fond of analogies, compares the roots of plants to the absorbing lacteal vessels in animals. The earth he calls the stomach of plants.† The propriety of these terms will be attended to in the section on vegetable digestion, in Part ii. Meanwhile, the student ought not to be misled by the specious language of the illustrious Swede."

We select, as another example of the learned author's mode of conducting this inquiry, his reflections on the size, functions and appearances of the leaves (p. 61).

" 1. More than twenty-five thousand species of vegetables are now known to the botanists; and of this number a very large proportion is furnished with leaves. None of the trees, strictly so called, are destitute of these beautiful parts. Some vegetables, however, are leafless. Such are the two species of Ephedra,‡ or Shrubby Horse-tail, and the great family of Fungous plants. These last have many of the habitudes of animals, and even the circumstance of their being leafless vegetables is one in the series of their relations to that vast empire of organized bodies.

" 2. The leaves of certain vegetables acquire a very great size. It is curious too, to remark, that it is only in the hot or hottest portions of the globe, that we find the largest leaves. I believe that the cold climates, and even those which are moderately warm, do not furnish us with any instances of very large-leaved trees. It does seem, that the magnitude of the leaves of certain species of trees increases as we approach the line.§ In the cold climates, we find no Palms, with leaves so large as to be capable of sheltering whole families from the inclemency of the weather.‖ Why should we doubt (when

* " See Part ii.

† " Plantarum *Ventriculus* est *Terra, Vasa Chylifera Radix.*" Philosophia Botanica, &c. p. 93.

‡ Ephedra distachya, and Ephedra monostachya. The first species is a native of the south of France, and of Spain: the latter is a native of Siberia.

§ The amiable Bernardin De St. Pierre.

‖ One of the largest leaves that are known to us is that of the Talipot (Corypha umbraculifera), a native of Ceylon. Robert Knox assures us that a single leaf is capable of covering from fifteen to twenty persons. He

a vast system of benevolence is so conspicuous in this earth), that in giving to the vegetables of hot climates such capacious leaves, the Author of the universe had consulted the health, the comforts, and the pleasures of the human inhabitants, destined to live beneath the scorching rays of the sun? But man is not the only animal that derives advantages from the large-spreading leaves of tropical trees. The birds, and many other animals are equally benefited. Destitute of this shelter, many species would be nearly incapable of subsisting in the countries in which they reside: and, in particular, they would be incapable (unless their instinctive operations were essentially varied) of rearing their young.

"3. The precise time of the year and month in which any given species of vegetable unfolds its first leaves is denominated, by Linnæus, *Frondescentia.** To this subject, the Swedish naturalist has paid much attention. He made a great number of observations, in eighteen different provinces of his native country, situated between the sixtieth and seventieth degree of north latitude, in the years 1750, 1751, and 1752. It was his object to discover which species of trees begin to open their buds, and unfold their leaves, at the most proper time for the sowing of Barley. The result of his inquiries was, that the Birch-tree (Betura Alnus) gave the most proper indication for this purpose. He justly imagined, that in every province of Europe, there exist other trees, which will, in like manner, indicate the proper time for sowing grains of different kinds, and also esculent herbs. This is, certainly, a subject worthy of the attention of naturalists, whose inquiries are directed to utility. Much important information would result from an extensive investigation of the subject. The agricultural rules of savage nations are frequently founded, in a great measure, upon the frondescence, together with the time of flowering, of different vegetables, indigenous in their countries. Thus, the Indians, in different parts of North-America, are of opinion, that the best time for planting the maize, or Indian-corn, is when the leaves of the white-oak† first make their appearance; or rather, as they express it, when the leaves of this common tree are of the size of a squir-

considers the Talipot as one of the greatest blessings that Providence has bestowed upon the inhabitants of a country, which is parched by the sun, and inundated by the rains, for six months in the year.

* From *Frons*, a leaf.

† Quercus alba.

rel's* ears. I shall have occasion to touch again on this subject, when treating of the *Calendarium Floræ*, or Calender of *Flora*.

"4. By the term *Defoliatio*,† or Defoliation, Linnæus means the season of the year at which the vegetables of any particular country shed their leaves. Thus, this term is directly opposed to that of frondescentia. With respect to the defoliation of vegetables, it is proper to observe, that the same species does not always drop its leaves at the same time, even in the same district of a country; but, in particular, that the same species sheds its leaves at very different periods, in different countries. In both instances, the difference of the time of defoliation seems to depend, principally, upon a difference of season, or of climate. Extreme heat and extreme cold are both observed to be favourable to the fall of the leaf. In the hot summers, the leaves of many plants lose their verdure, and fall a full month earlier than they do in milder seasons.

"5. The fall of the leaf is almost always preceded by a very essential change in its colour. Yellow, red, and brown, are the most common colours of the dying leaf. About the close of September, (sooner or later, according to the season,) the forest-trees in Pennsylvania, and other middle parts of the United States, begin to lose their verdure. The leaves assume new colours, particularly yellow and red, or crimson. Nothing can be more picturesque than an American forest at this season. The beauties of the scenery will be described by some future Thomson; or exhibited on canvass by the pencil of an American Salvator Rosa. It will be sufficient for me to observe, that the leaves of almost all the species of Juglans (walnuts and hickory) and Maple, assume different shades of yellow; whilst those of Nyssa integrifolia, called gum, the Laurus Sassafras, the Cornus florida, or Dog-wood, and others, are clothed in a livery of crimson or red.

"6. Some vegetables do not drop their leaves at all, during the whole year. Their verdure is not, in the least, injured by the changes of the weather. The Fir, the Juniper, the Yew, the Cypress, the Kalmiæ, and many others, belong to this class of evergreens, as they are very emphatically called. In general, the leaves of the evergreens are harder and less succulent than those of deciduous vegetables. It is

* Sciurus cinereus, the most common species of Squirrel in North-America.

† From *de*, and *Folium*, a leaf.

observable, also, that their surfaces are covered by a very thin, parchment-like cortex, or bark. It is found, that they perspire less than the leaves of deciduous vegetables. Some writers have, accordingly, conjectured, that the sempervirent quality of these vegetables is owing to the smallness of their perspiration. Dr. Arbuthnot imagined, that the verdurous quality was owing to the leaves containing more juices than can be exhaled by the sun. The celebrated Dr. Grew supposed, that a thick epidermis, dense cellular substance, and few tracheæ, or spiral-vessels, are the true cause of the perpetual verdure of these vegetables. Duhamel thought, that this state of the vegetable depended upon a hard knot, at the base of the leaves. Others, again, have supposed, that a gummy matter, residing within the vegetables, is the cause of the lasting verdure. But if this were the case, we should find, that Cherry-trees, Plumb-trees, Peach-trees, and other vegetables that abound in gum, would be evergreens also. Perhaps none of these explanations of the cause of the evergreen quality of leaves is wholly satisfactory. The circumstance seems principally referable to climate. The same species is a perdifoil, or drops its leaves in one climate, and preserves them in another. Thus, the Passion-flower* of America, and the Jasmine of Malabar,† are evergreens in their native climates, but become perdifoils when they are transplanted into Britain and other northern parts of Europe. On the other hand, many of the perdifoils of cold climates, when transplanted to warmer climates, become evergreens. Thus, the Quince-tree is a perdifoil in northern countries, but becomes an evergreen when transplanted to the south of France, the island of Minorca, and other southern climates. I am assured, that the Currant-bushes which were sent from Britain, where they are deciduous, to the island of St. Helena, became, in a short time, evergreens, but ceased to bear fruit. Professor Thunberg informs us, that the Oak, (Quercus Robur), the White Poplar (Populus alba), and other trees which were imported from Europe to the Cape of Good Hope, "shed their leaves in the winter, as they do in their native places, whereas the African trees do not part with theirs. It is not long, however, (continues our author) before they recover their leaves again. This circumstance is singular enough: first, because the cold here (at the Cape of Good Hope) in winter is not more severe

* "Passiflora coerulea.
† "Jasaminum grandiflorum.

than it is in Sweden in the autumn; and, in the second place, because they shed their leaves to the southward of the equator at the very time that they put them forth to the northward of it."*

"7. Mr. Bruce informs us, that all the leaves of the trees in Abyssinia are very highly varnished, and of a tough, leather-like texture, which enables them to support the constant and violent rains under which these trees are produced.† This is a wise provision of nature. But in what, the highest or the lowest object, is not thy wisdom, NATURE, conspicuous?"

It was our intention to have ended our quotation here; but Dr. B.'s section on the buds of plants is so sensibly and pleasingly written, that we cannot, in justice, refrain from extracting at least a part of it (p. 98).

"The construction of buds is at once beautiful and intricate. On the exterior surface of these vegetable cradles, we observe a number of scales, which are more or less hard, hollowed like a spoon, and laid over each other, in the manner of tiles upon the roof of a house. These scales are often beset with hairs, and other species of pubescence, and are fixed into the inner plates of the bark of the stem and branches, from which bark they seem to proceed. We cannot be at a loss to determine the use of these bud-scales. They serve to defend from cold, and other injuries, the tender and delicate embryon-plants, that are contained within the bud. The scales are often sealed, as it were, or connected to each other, and to the embryon within, by means of a thick, clammy juice, which, in the buds of many vegetables, such as the Populus balsamifera, or Tacamahaca-tree, is of a resinous nature, and highly odoriferous. It is probable, that in some plants this viscous matter may be useful by preventing an excess of perspiration from the bud. When the internal parts of the bud have expanded and unfolded, the scales, being no longer useful, fall off.

"The following observations of Ledermuller, an ingenious German naturalist, are well calculated to show the delicate and careful structure of the bud. In the winter-season, he separated from a horse-chesnut (Æsculus Hippocastanum), a bud, not exceeding in size a common pea. He found the bud to be covered externally with seventeen scales, anointed with a viscid

* "Travels in Europe, Africa and Asia, &c. vol. i. p. 104, English translation. London. 1796.

† "Travels, &c. Appendix. p. 151, 152, quarto edition."

fluid. Having carefully separated these scales, the whole bud, covered with a lanugo, or down, was brought into view. On removing the down, he found the bud surrounded with four branch-leaves, and covering a spike of flowers. In this spike, our author very distinctly counted sixty-eight flowers! By the assistance of a microscope, even the pollen, or fecundating powder of the stamens, was observable. Some of it was opaque and some transparent.

"Three different species of buds are enumerated by the botanists. These are, 1. a bud containing a flower; 2. a bud containing a leaf, or leaves; and, 3. a bud containing both flowers and leaves.

"The first species of bud that I have mentioned, is denominated *gemma florifera*, or the flower-bud. This contains the rudiments of one, or several, or many flowers, without leaves, folded over each other, and surrounded with scales. To this species of bud, the French have given the name of "bouton a fleur, ou au fruit." It is often found at the extremity of the small branches of certain trees, which branches are shorter, more rough, and less beset with leaves, than the other branches. It is also observable, that this flower-bud is, in general, thicker, shorter, more square, and less pointed than the other kinds, which are next to be mentioned. It commonly terminates obtusely. This is the *gemma floralis* of Linnæus.

"This species of bud is particularly mentioned by Pliny, who calls it *oculus gemma*. It is the bud which is employed in that species of grafting which is called inoculation, or budding.

"2. The second species of bud is the *gemma foliifera*, or leaf-bud. It contains the rudiments of several leaves, without flowers. This kind of bud is commonly more pointed than the first species. In some vegetables, however, as the Hazlenut, it is nearly round; and in the Æsculus Hippocastanum, or Horse-Chesnut, it is very thick. Linnæus calls this species of bud, *gemma foliaris*.

"3. The third species of bud is the *gemma foliifero-florifera*, or flower and leaf-bud. This is the most common species of bud. In general, it is smaller than either of the two preceding buds, and produces, as the name imports, both flowers and leaves. Linnæus denominates this bud, *gemma communis*.

"In this species of bud, however, the flowers, which are mixed with the leaves, are not always of the same kind. Some-

times the bud protrudes, 1. Male-flowers with leaves, as in the Pine, and Fir-tree: 2. Female-flowers and leaves, as in the Hazle-nut, and Carpinus, or Horn-beam: 3. Hermaphrodite flowers and leaves, as in the Elm-tree, Cornus, or Cornel-tree, Daphne, or Mezereon, and the Almond-tree.

"Those buds which are evolved into leaves only, are called barren buds. Those which contain both leaves and flowers are denominated fertile. These terms are very properly applied. It is observed, that from the size or bulk of the bud we can often foretel whether it contains merely leaves, or flowers and leaves together.

"The final object, or ultimate end of the GREAT CREATOR OF THE UNIVERSE, in forming buds, must now be sufficiently obvious. They are the protecting domes, the cradles, of tender embryons, which, in due time, are to burst from their enclosures, expose themselves to the light of the day, and spread eternal beauties over this earth.

"Vere nitent Terræ, vere remissus ager,
"Nunc Herbæ, rupta tellure, cacumina tollunt,
"Nunc tumido GEMMAS cortice palmes agit."

OVID. Fast. IV. l. 126.

"Such being the use of the parts which I am considering, we are not to wonder, that the greater number of the trees and shrubs of cold climates are furnished with buds. In such climates, the protection which buds afford is wanted. Lofling has observed, that the Frangula, a species of Rhamnus, or Buck-thorn, is the only native tree of Sweden which is destitute of buds.* And how beautifully does this vegetable demonstrate the office of the bud! The Frangula requires not the protecting aid of these winter-quarters: for, "it grows under trees, in the marshy forests, where it is defended, along with other plants, from the severity of the winter."†

"On the other hand, it ought not to excite our surprise, that buds are so seldom found upon the vegetables of warm climates: I mean those climates where an intensely cold winter is unknown. For, in many countries, as in those of the northern and middle States of the American Union, although the summers are extremely warm, the winters are also intensely cold.

* "See his excellent paper, entitled 'Gemmæ Arborum,' in the Amoenitates Academicæ, Vol. II. Dissertatio XXIV."

† "Frangula est unica arbor indigena *Sueciæ*, quæ gemmis caret, sed habitat illa sub arboribus, in nemoribus paludosis, cum aliis plantis a sevitia hyemis defensa."

In climates which enjoy an uniform series of mild or warm seasons, the tender shoots of vegetables do not stand in need of the protection of buds. The following list, from Lofling, will show what vegetables, among others, are destitute of buds; viz. Citron, Orange, Lemon, Cassava, Mock-Orange, Blad-Apple, Shrubby Swallow-wort, the Shrubby Geraniums,* Berry-bearing Alder, Christ's Thorn, Syrian Mallow, Adansonia or Baobab, Justicia, Wild Senna, the Acacias and Mimosas, Coral-tree, Stinking Bean Trefoil, Oleander, Tamarisk, Heath, Barbadoes-Cherry, Tree-Mallow, the Shrubby Night-shades,† Guinea Henweed, Cypress, Lignum Vitæ, and Savin. Some of the vegetables in this list are large trees, such are the Adansonia, several of the Mimosas, &c. whilst others are smaller, but furnished with ligneous or woody stems, and belong to the families of shrubs and under-shrubs, as they are denominated by the English writers.

True or complete buds are never produced upon the annual plants, or those whose root and stem perish after the term of a year.‡ In these annual plants, however, small branches, like minute feathers, are protruded from the axils of the leaves. These feather-like processes, which seem to supply the place of the buds, wither without undergoing a more complete evolution or expansion, if the plants to which they belong are scandent, that is, climb, and are destitute of lateral branches. But, in many other annual plants, these feather-like bodies, or small branches, grow into plants, similar to the parents.

"In the trees of warm and hot countries, an appearance similar to that which I have described, is observed to obtain. In these trees, several of which are enumerated in the preceding list of budless vegetables, a plumula, or small feather, emits branches, without, however, any scaly covering: for, as I have already observed, this covering is not wanted where there is no severity of climate to injure the tender shoot. The scaly covering essentially belongs to completely formed buds. "When we, therefore, speak of trees having buds that are naked or without scales, our meaning is the same as if we had said, that they have no buds at all."‖

* "Geranium fulgidum, G. inquinans, G. papilionaceum, G. betulinum, G. scabrum, G. cucullatum, G. gibbossum, G. carnossum, G. peltatum, G. acetosum, G. zonale, G. vitifolium, &c. &c. of Linnæus."

† "Solanum verbascifolium, S. guineense, S. Pseudo-Capsicum, S. diphyllum, S. bonariense, S. pimpinellifolium, S. sanctum, S. tomentosum, S. bahamense, &c. of Linnæus."

‡ "See pages 15, 16."

‖ "Milne."

"Mr. Ray and Pontedera have instituted a division of vegetables into herbs, or herbaceous vegetables, and trees, founding the distinction upon the absence or the presence of the gemmæ, or buds. The herbs they have distinguished by the name of plants wanting buds; the trees by that of vegetables bearing buds.

"This division of the English and Italian naturalists, however, is certainly erroneous, and is calculated to introduce much confusion into the science of vegetables. It might not be improper, indeed, to adopt such a distinction in the history of the plants of one country, not very extensive, or not enjoying very different climates. But it ought not to be adopted in the history of the plants of the whole globe; since it plainly appears, that the greater number of the trees of warm climates are destitute of buds, or, at least, of that scaly appearance which seems to belong essentially to buds; and, hence, such trees, some of which are very large and stately, ought, upon the principles of the two authors whom I have mentioned, to be thrown into the same class or series as the humble herbaceous plants. Father Plumier discovered much judgment in associating together the trees and the herbaceous plants; though his illustrious countryman, Tournefort, had kept them asunder.

"With respect to the origin of buds, two different opinions have been entertained by botanists. Pontedera, a very learned Italian botanist, imagined, that the buds derive their origin from the ligneous, or woody fibrillæ. This opinion has not, so far as I know, been adopted by any succeeding naturalist.

"It is much more probable, that the buds derive their origin from the medulla, or pith of the vegetable. It is certain, that the pith is essentially necessary to the existence and growth of the buds. But this subject will come more naturally to be treated of, when examining the anatomical structure of vegetables.*

"As every vegetable-bud contains the *primordium*, or embryon of a plant, and if separated from its parent, and nurtured with care, would produce a plant specifically the same as the supporting stock, we are led to reflect upon the unbounded fertility of Nature, who seems to have taken delight in forming (I would say to the extent of her power, if to the power of nature there were any limits,) living, organized existences. Linnæus has made a calculation, by which it appears, that ten thousand buds, or, in other words, ten thousand herbs, may be produced from a single trunk, not

* "See Part II."

exceeding a span in diameter. What an infinity of plants, then, might be raised from some of the most stupendous trees, such as the Adansonia of Africa, or the Liriodendron, Platanus, and others of North-America! But the fertility of nature, in the formation of buds, is infinitely greater than even philosophers themselves have, in general, imagined. MILLIONS OF BUDS LIE LATENT IN THE TREE, AND NEVER MEET THE LIGHT OF THE DAY. The embryon punctum is not evolved into notice, from a deficiency of those stimulating agents, which, if they be not the sole cause of life, are, at least, essentially necessary to bring the phenomena of life into view."

In addition to the eight kinds of pericarpium described by Linnæus, we observe Dr. B. has added the four others proposed by Scopoli. And accordingly the *Theca*, *Granatum*, *Cysta* and *Scrinum*, are severally explained (p. 196). And his observations on seeds, with the means by which they are disseminated over the face of the earth, and their powers of germination, will be perused with interest by all the lovers of vegetable physiology. But our restricted limits forbid their insertion here. We make the like remark on his chapter upon the Calendarium Floræ (p. 296), by which it appears that our native Indians had a way of distinguishing the periods of time in the year by names derived from something relative to plants and animals, very analogous to what we know formerly prevailed among our Saxon ancestors. A good etymological display of the latter may be seen in the introduction to Bailey's Dictionary, and easily compared with the similar researches now before us. It is a curious fact, that the ingenuity exercised latterly in France, in giving names to the months, is scarcely, if at all superior, in propriety and correctness, to the calendar existing ages ago among the Cherokees and Angles.

The second part of Dr. B.'s performance treats of the physiology of plants. But the consideration of this, as well as of the third part, which exhibits the sexual method of Linnæus, we are obliged to postpone. In a future number of our Review we propose to continue the examination.

In the mean time we would observe that there is a valuable section subjoined to the account of each of the classes of vegetables, in the latter division of this work. In these the author has compared the prevailing technical arrangement of the schools with the natural orders of plants. He has examined the classific character of the twenty-four great departments of the science, and elucidated it with many critical and pertinent

observations. In executing this practical part of his task, he appears to us like a man who, in addition to the knowledge of books, prints, and dried herbariums, acquired in his closet, had taken a broad survey of the face of creation out of doors, had traversed mountain and valley, lake and fen, to find and examine vegetables in their native stations, and who, of course, is entitled to that weight and authority which is due to talents accompanied by candour, experience, and discriminating powers. The remote parts of New-York, Pennsylvania and Virginia, have heard of his rural excursions and herbalizing campaigns on both sides of the Kattskill and Alleghany ridges; as he deemed it both decorous and useful for a professor to avoid the ridicule inseparable from the character of a metropolitan or *city-botanist*, and to study the science in the country itself, where plants of the natural growth abounded.

The student of botany will find in this part of these Elements catalogues of the principal genera of plants growing in Fredon. To the end of each of his critical and characteristic discussions, Dr. B. has a list of the great families of the respective classes which grow in North-America. This will facilitate the progress of the inquirer, and save him from a world of embarrassment and trouble. Knowing what this quarter of the globe affords, he will judge of what he is likely to find, and may be relieved from the fruitless toil of searching for the vegetables peculiar to Otaheite, New-Holland, Japan, or the Cape of Good-Hope: and for this our Botanical tyros may be very much obliged to him.

We ought not to close our remarks on this valuable and interesting volume, without expressing our regret that it is defective in a table of contents and an index. A book containing many various and miscellaneous materials is certainly published in an incomplete form, without something of the kind to aid and direct the reader. Though the subjects appear perfectly plain and easy to the writer, the case is commonly very different to him who has every thing to learn. An index is like the map of a country, and certainly affords great instruction, relief and satisfaction to him who is to travel through and explore it. On this point Linnæus was remarkably careful. His Philosophia Botanica is supplied with a triple index; one of the *terms*, another of the *genera*, and a third of the *other contents*. His Genera Plantarum have also a full index both of the generic names and of their synonymes; to which is subjoined the arrangement of these under their *na-*

tural orders. The same is true of his Species Plantarum, in which a three-fold index gives the reader an easy method of finding each generic name, every synonimous word, and all the trivial epithets. With a little more labour, Dr. B.'s volume might have been furnished with such a convenience, which, like a path with a lamp and a direction-post here and there, would have conducted his reader agreeably through a regular garden or parterre, instead of leaving him to brush among the thickets, and see his way through the wilderness as well as he can.

(To be continued.)

ART. III. *The Town and Country Friend and Physician; or an affectionate Address on the Preservation of Health, and the Removal of Disease on its first Appearance: supposed to be delivered by a Country Physician to the Circle of his Friends and Patients on his retiring from Business. With some cursory Observations on the Treatment of Children, &c.* 18mo. pp. 108. *Philadelphia.* J. Humphreys. 1803.

HERE is another manual of health, which some benevolent person has compiled, with the express intention, as he informs his readers, of promoting domestic happiness. For this purpose he has not taken the trouble of an original inquiry into the different branches of his subject, but has freely borrowed what he deemed proper for his purpose from the writers before him, who have treated on the art of preserving health, in verse and prose. He does not affect new sentiments, but frankly avows, in his preface, that the first part of his book is nearly copied from "The Villager's Friend and Physician," printed in England; and the second part from some other late celebrated publications on the means of preserving health and prolonging life.

There is something agreeable in the contemplation of an aged physician giving to his neighbours and employers a few friendly words, as he withdraws himself from business, *still retaining full possession of his understanding;* and such a person, executing, as it were, his professional will and testament, makes a noble bequest of his treasures of observation and experience, and constitues the whole human race his legatees. The generous and liberal conduct of such a testator excites a sentiment of thankfulness and respect in the breast of

most persons who receive their portion of this choice inheritance. It puts us in mind of PENN, dealing out maxims and advice to preserve the moral health of his children; and of WASHINGTON, pointing out to his fellow-citizens the critical condition of their body politic, with the means of keeping it wholesome and sound. The intent and meaning of such acts, when they are conceived to be good, have such a conciliatory operation, that in spite of all the positiveness and errors of old Dr. Dovar, we can read *The Ancient Physician's Legacy to his Country* with considerable pleasure, and moralize as we go along on the very moderate compass wherein he comprized what he had collected in forty-nine years practice.

The Æsculapian sage, in the tract now before us, gives such good counsel to *his friends*, that the adoption of it would ruin his successor's prospects of growing rich as a practitioner. To show his disinterestedness, he assures them he is poorer at the close of his labours than he was when he began to prescribe for them. And from the small size of his book, it cannot be expected he means to grow wealthy by that. Under such circumstances we cannot but admire his philanthropy: for is it not matter of admiration, we ask, that a physician who has, with great hazard, toil and expense, acquired a profession, the object of which is to practise, and thereby reimburse him his capital, with large profit, and provide for his own and his family's subsistence at a distant day as well as during the present hour, should so far mistake his business as to put people upon a plan of preventing those very diseases, by the cure of which he is to signalize his skill, to extend his reputation, and to build up an estate? Yet when we reflect on the impetuosity of human appetites and passions, and on the neglect with which these monitory epistles are commonly treated, we do not perceive that any considerable effect is likely to be produced to the injury of the steady practiser. Though some of the brethren may be so indiscreet as to betray mysteries of the craft, and instruct the people in the art of living without their services, the greater part of the faculty will, however, generally continue to be faithful keepers of their own secrets, wisely observing the distinction between the *preventing a man from getting sick*, and *curing him after he is sick*. And although the "*Family Physician*" should deal in "*Domestic Medicine*," and take the "*Guide to Health*," "*Hygeia herself*," and the "*Villager's Friend*," into consultation, and thereby strive to make "*Every Man his own Doctor*," there is, after all, strong reason to believe,

that the greater part of the visits and advices will continue to be paid and bestowed *more majorum.*

Very different from those reserved and sapient doctors who keep the greater part of their knowledge snug within their own noddles, is the disposition of the communicative old gentleman whose work is under review. He chats and prattles at an entertaining rate: he relates what he has seen and what he has meditated: he tells people what is good for them and what is bad for them: and he enlivens his plain narrative with now and then a quotation of a poetical kind. Our readers may, if they please, imagine themselves listening to him as he holds forth in the following strains. (p. 4.)

"You observe that I offer to you plain, unadorned truth; but if my address prove useful, I shall be fully satisfied with the portion of eloquence it may contain. To many of you I am indebted for your confidence, and to all of you for your kind wishes. Accept, in return, with my farewell, the following suggestions, intended to promote your happiness, as well as to enable you to preserve or restore your health.

"As most of you are men who benefit society by your labours, gaining your livelihood by the sweat of your brows, you will not be surprised that I commence my instructions with a few remarks on *exercise* and *labour*.

> 'Toil and be strong. By toil the flaccid nerves
> Grow firm, and gain a more compacted tone.' *Armstrong.*

Truly does this author say,

> ——————'By health the peasant's toil
> Is well repaid.'

"Exercise, indeed, gives strength to every fibre, and energy and spring to all the vital powers. In a word, man is rendered

> 'Robust with labour, and by custom steel'd
> To every casualty of life:'

For strength is increased by being used, and lost by being too much hoarded. But I need not dwell on the advantages derivable from exercise, to you, who have experienced them whilst engaged in the labours by which your families are supported. No! to you whose habits are those of industry, some few cautions against the excessive and irregular indulgence of those habits will be more beneficial. Be assured then, that all violent and long-continued exertions, even in your wonted labours, may not only prove of serious injury to your health,

but will also lessen, rather than increase, the weekly provision for your family. Remember that the vital powers, the powers by which life is continued, can only be urged to a certain point without injury. If nature be robbed of due repose now, she must repair the loss another time, or sink, overcome, exhausted of the *fine and subtle spirits.*

'Pursued too closely, e'en the gentlest toil
Is waste of health.' *Armstrong.*

"He who thus inconsistently, from motives of economy, extravagantly expends his health, may be said to labour hard to catch disease: For,

'He gets little for his pains,
Who sad disease by labour gains.'

"The all-wise Disposer of all things has decreed the due exercise of our powers to be an inexhaustible source of pleasure; so that man returns to his daily toil with cheerful alacrity. But excessive exertions take away all zest for work; and no wonder; for if even too much pleasure will cloy, how much more must too much hard work? No! no! Take moderate meals of hard work, and then to it again with a relish for it. Think not, however, I mean to lull you into indolence; far from it.

'Behold the wretch who slugs his life away,
Soon swallow'd in disease's sad abyss;
While he whom toil has brac'd, or manly play,
Has light as air each limb, each thought as clear as day.'
Thomson.

Moderate and regular labour coils up the main spring of life, but wild and irregular sallies may break it. He that is steady is ever ready. Regular exercise will demand regular rest.

——————'Weariness
Can snore upon the flint, when resty sloth
Finds the down pillow hard.'

Watch the steady pace of the sun; let his rising lead you to labour, and his setting to rest, or to rational amusement; for

'He who rests and labours by the sun,
His course of toil does fairly run.'

"Besides, I have one truth to disclose to you, which, perhaps, you have not discovered. Virtues may have bastards; and therefore industry may become the mother of drunkenness. For nature, urged too far, pants and seeks for rest; but her thoughtless driver spurs her on. The pernicious, the poison-

ous dram, is swallowed, glass after glass, whenever the spirits flag; and thus he who gets a hard hand too often gets a parched mouth. This as generally leads to the ale-house as that does to the house of misery and disease. Consider a little, my friends, how little you gain by earning six shillings instead of four, when the publican gets one half of your earnings, and physic runs away with the rest.

"But let us not pass the ale-house without a word or two respecting the good cheer it affords. Most of us are pretty well acquainted with the delightful refreshment a glass of ale or spirits yields when a man is fatigued. Well would it be, if we all knew as well the mischiefs arising from taking a little too frequently what is called *a little drop*, so that we might be sufficiently on our guard against that insidious enemy, the love of drink. This is an enemy against whom you should always be on your guard, for he uses every trick of war. Sometimes he comes on by slow and unheeded approaches; sometimes his attacks are open and violent; and oftentimes will he fight under false colours, and whilst he is received as a friend, cruelly deprive those he has deluded of every comfort, and at last of life itself. He who, being engaged in works of labour, flies to liquor for a spur, whenever nature droops from too great exertion, makes terrible havoc with himself. Nature, before worn down, is now forced and strained by these unnatural efforts; and if these be often repeated, the shattered nerves will show the vast damages they have suffered. Tremblings, sinking of the spirits, sleepless nights, and days of dreadful listlessness, will be the forerunners of some deadly malady.

"You will, perhaps, be at first surprised at the assertion, but you will, on reflection, I am sure, agree in its being well founded, that the cautious, but frequent sipper, is more exposed to be overtaken by disease, in consequence of indulgence in his favourite habit, than him who revels openly and unguardedly. The former generally allows the elevation he has experienced from his first sip to subside before he takes his second, and that of the second before he takes his third: thus gradually instilling the poison into the system, he has not the warning of intoxication to apprize him that, although he exultingly applauds himself for his extraordinary self-denial, the quantity he has sipped exceeds that which, taken by his neighbour with less management, has levelled him to the ground, and rendered him the object of our cautious sipper's harsh reproof. The more bold and shameless drunkard finds

a monitor, though generally too little regarded, in every drunken bout: the beastly situations in which he is placed by them, and the sufferings which succeed, are not entirely unnoticed:

> 'He sleeps, and waking finds himself undone;
> For prodigal of life, in one rash night
> He lavished more than might support three days.' *Armstrong.*

Loud, but weak resolves are uttered; such filthy excesses are never more to be committed.

> 'Ah, sly deceiver! branded o'er and o'er,
> Yet still believed! exulting o'er the wreck
> Of *sober* vows!'

"Drunkenness, my friends, that vice, or rather let me say, that crime, which engenders all other crimes, is a baleful curse wherever it falls. It degrades man below the meanest reptile, renders his sober hours irksome beyond bearing, brings on the most dreadful diseases, and at last places him on a death-bed, the pillow of which it has filled with thorns. Dreadful is this picture, and many of you must feel its truth. But how, you ask, shall we profit by it? How shall we rid ourselves of such a dangerous foe? Not by trifling with him—not by gentle resistance—not by endeavouring gradually to disengage yourself from his horrid gripe. No; an enemy so formidable must be firmly and strongly opposed; not an inch must be yielded to him. Consider, if you break not his neck he will break yours, and perhaps the hearts of those who are dearest to you. Call to your aid self-love, as well as regard and compassion for your family, who innocently suffer for your indiscretions. Crave the support of reason and religion.

> 'Let god-like Reason, from her sov'reign throne,
> Speak the commanding word—I will—and it is done.'
> *Thomson.*

Do not be lulled into a false security, founded on one or two incorrigible drunkards enjoying seeming health, for they own not what they suffer; but judge from a larger scale. Look back to the latter days of all the votaries of Bacchus that come within your recollection, and then you will discover that, in general, the wine-bibber is doomed to the torments of the gout, or of the stone or gravel; the dram-drinker becomes bloated with dropsy, and the swiller of beer stained with jaundice.

——————' The yellow fiend,
Tinged with her own accumulated gall.'

I am sure, if you but reconsider what has been said, although you may accuse me of preaching, you will not regard a drunken bout as a trifling matter. Look back but to the last adventure of this kind, and strive to

————————' Recollect
What follies in your loose unguarded hour
Escap'd. For one irrevocable word,
Perhaps, that meant no harm, you lose a friend;
Or in the rage of wine your hasty hand
Performs a deed that haunts you to the grave.
Add that your means, your health, your parts decay;
Your friends avoid you; brutishly transform'd,
They hardly know you; or if one remains
To wish you well, he wishes you in heaven.' *Armstrong.*

" Besides, he who drinks much can eat but little, and strength is never gained by starving; one shilling spent with the baker and butcher is better than ten with the publican. Moderation is indeed always commendable, but there is little fear that the labourer will kill himself with cramming; for hard work and hard fare too often go together, and industry seldom messes with glutony. Indeed, it cannot be denied, that

' Gross riot treasures up a wealthy fund
Of plagues, but irremediable ills
Attend the lean extreme.' *Armstrong.*

" I am not one of those who can calculate to a grain on how little a man may keep life and soul together; but yet I cannot refrain from cautioning you against waste, and reminding you that good housewifery will make one pound go as far as two."

His directions on the management of children abound with the same talent which appears in the passage just quoted; and as it may give our readers another example of the manner in which this veteran proceeds to talk to his customers (p. 92), we once more admit them to an audience.

" The *physical education*, or, in other words, the *bodily treatment* of INFANTS, on which depends so much their future health and comfort, forms unquestionably an object of such importance as would be criminal to omit a few short instructions respecting it. The great disproportion subsisting between healthy and diseased children, together with the deplorable mortality which occurs among the latter, too plainly evince, that their bodily welfare is not sufficiently attended to.

" So long as the nursing of children remains exclusively in the hands of common midwives and nurses, it is rather a matter of surprise that so many infants should survive the age of childhood. We ought, therefore, above all things, to inquire into the monstrous prejudices prevailing in this essential part of domestic management, and thus make the first step towards their eradication.

" From the difficulty of discovering the true cause and seat of the complaints of children, especially if accompanied with any particular symptoms in the excretory vessels, it is very usual to administer a *gentle laxative* or *emetic* upon the slightest occasion. It would lead me too far to examine, in detail, the many bad consequences resulting from so absurd and detrimental a practice. I cannot, however, forbear to remark, that, by dealing constantly in aperient medicines (a strange infatuation among the poor) the future diseases of the child assume a particular character of the *gastric* kind; for the juice of the stomach, which serves to concoct the food, is thus vitiated. As the operation of laxatives is in a manner mechanical, by impelling the fluids, and particularly those of the mucous kind, towards the stomach and bowels, and causing them to accumulate in a greater degree than usual, it will be easily understood, that, by the frequent repetition of this stimulus, the gastric juice will be rendered unfit to effect the proper solution of food in the stomach.

" Frequent *bathing*, in infancy, is a powerful means of counteracting and suppressing the disposition to stomachic and bilious complaints, which, at present, are uncommonly prevalent among children and adults, and are frequently accompanied with diversified nervous symptoms. By a *proper* use of the bath many infantile diseases may be safely prevented; catarrhs suppressed, or greatly mitigated; teething rendered easy; and the whole physical condition of the child considerably improved, from the efforts of nature to throw off malignant humours by the pores.

" An erroneous notion too much prevails, that the good effects of bathing are principally to be ascribed to the *cold bath*. The use of any bath, indeed, whether cold or warm, that is, the stimulating impression excited by the water, is, of itself, an excellent tonic, serving to brace and invigorate the whole system. The cold-bath, however, belongs to the class of *heroic remedies*, and in its sudden and powerful effects nearly resembles electricity. The lukewarm bath, on the contrary, produces an uniform revolution and salutary purification of all

the fluids. For these reasons I consider the *tepid bath* as in every respect preferable, since it may be used somewhat cooler for thriving children, or warmer for those of a weekly constitution, and the requisite degrees of heat be regulated according to the increasing age and strength of the child. In summer the water of the bath ought to be exposed the whole day to the rays of the sun, which will impart to it an agreeable and congenial warmth. Rain or river water is the most proper for this purpose; but if it be necessary to use spring or well water, it should be previously softened with a small quantity of boiled water, in which a quarter of an ounce of soap has been dissolved, with the addition of a little bran or oatmeal, or if milk can be obtained, it will be a still more useful ingredient. I would particularly recommend not to boil the *whole* quantity of the water to be used for bathing, as it would in that case be deprived of its aërial constituents, which are not without their importance in the bath. During the first weeks and months the child should not be suffered to remain in the bath longer than five minutes, and the time may be gradually increased to a quarter of an hour. During the whole process of bathing the body should not remain inactive, but be gently rubbed with the hand. It is of consequence to attend to the point of time when the child is taken out of the bath; for, in almost every instance where warm bathing disagrees with the child, it will be found to arise from neglect in not wiping and drying the body with sufficient expedition at this particular period. Hence it is highly necessary to keep warm clothes in readiness, in which the child should be wrapped up and dried the very moment it is taken out of the bath. Every one in the habit of bathing must have observed, that the evaporation of water on the skin excites penetrating and uncomfortable sensations of cold; and there is an astonishing difference of temperature between actually being in the water, and having water on the skin after quitting the bath. If, therefore, a child, from want of due precaution, be kept for several minutes with a naked, wet body, it will be liable to contract a cold, the more dangerous in its consequences, as it immediately succeeds a state in which the body has been warm and the pores open.

" It should be farther observed, that bathing, immediately after a meal, or with a full stomach, is highly improper, if not dangerous, both in children and adults; nor is it advisable, in rough weather, to carry a child into the open air too soon after bathing. The most proper time for using the bath is

the evening, when the child can be removed to bed as soon as it is completely dried.

"To the frequent bathing in water I would particularly recommend another species of bath, equally indispensible, which I will call the AIR-BATH, or the daily enjoyment of fresh air. This is usually considered as a promenade, or walk of pleasure; and as children cannot judge of its great utility, and the weather is not always favourable for excursions, parents are sometimes guilty of unpardonable neglect in confining infants whole days and weeks together within their rooms. But if air be essentially requisite to animate the most subtle powers of man, it follows, that it is as necessary to the organs of life as food and drink; and that its salutary influence on the constitution does not so much depend on the state of it, with respect to pleasantness and serenity, as on its freshness and constant renewal. Hence, I would impress it on the reader, as a rule not to be violated, *to let no day elapse without affording the child an opportunity of imbibing the salubrious qualities of fresh air.*

"Persons unaccustomed to reflect on this subject can scarcely conceive what salutary effects the simple means here recommended, namely, the early habit of *washing*, *bathing*, and *daily airing*, produce on the constitution and physical formation of the child. The habit of body, growth and appearance of children properly educated in this respect, will be totally different from those who are reared, like foreign plants, in a hot-house.

"To point out still more forcibly the peculiar advantages attending the regimen here recommended, I will exhibit a picture of such children, not taken from fancy, but authorised by facts, and agreeable to the experience of many modern observers.

"1. A child, whose physical education is properly attended to, becomes more hardy, and less affected by the vicissitudes of climate and weather.

"2. Its body is straight and robust; its limbs are uniformly muscular, and well-proportioned.

"3. The stages of evolution in its different organs take place in regular succession—no power, no capacity outstrips another—its teeth do not appear too soon, nor at irregular periods—the child does not begin to walk too early nor too late; and the same order is observable with regard to its speaking. Even the mental faculties expand themselves more regularly; that is, not too rapidly, but after the most important

bodily changes have been effected. Every period of its progress to maturity comes on in a natural and gradual manner, so that the child, in a physical sense, longer remains a child; he does not mature into manhood before he has completed the proper term of youth; and thus every stage, as well as the whole career of his existence, is considerably prolonged.

"4. By this treatment the circulation of the fluids, and all internal motions, particularly of the lungs and intestines, together with the usual evacuations, are beneficially promoted. Of no less advantage is the bath to those children who are subject to habitual costiveness; a distemper which cannot be too much guarded against, not only during the age of childhood, but also throughout life: while infants, accustomed to the bath and fresh air, are scarcely ever known to suffer from this complaint.

"5. The texture of their muscular flesh becomes solid, the colour blooming, and the body neither appears tumid and spongy, nor parched and meagre. The complexion is lively and fresh; and the disposition to rickets, so common in children, is in them imperceptible.

"6. Neither are such children as enjoy the benefit of the bath, *properly* administered,* affected by that excessive sensibility, and diseased irritation of the nervous system, which, in many instances, so fatally degenerate into spasms, fits and convulsions. The irregularities in early life are chiefly instrumental in bringing on that pitiable state, in which some unhappy persons, through the whole of their lives, are little better than *locomotive, nervous machines*, or passive beings, that exist apparently for the sake of *feeling only, not for acting.*

"7. Diseases of the skin, eruptions, catarrhs, coughs, obstructions of the first passages, &c. seldom attack a child when *properly* treated; and if they do, their duration will be short, and the *crises* easy and natural.

"Lastly. CLEANLINESS in domestic life is one of the cardinal virtues, and an essential requisite to the proper physical education of children. Indeed, I cannot help remarking that this is, perhaps, the *only* province of parental care, in which we never can do *too much.* For this end we ought not to

* "I say *properly* administered, for if the means above stated are expected to produce their full effect, it should not be forgotten, that the *whole* management of the child ought to correspond and keep pace with the preceding practice. Without due attention to this circumstance, *constant* washing and bathing may not only prove of little service, but may, in some instances, be productive of mischief.

neglect the article of linen, as the frequent change of it is of more consequence than many parents may suppose. A child is much more liable to perspire than an adult; the natural effect of which is, that its linen is more readily soiled and rendered unfit for wearing. I would, therefore, advise all parents who can afford it, to give their children clean, dry linen *every day*. An undoubted proof of the utility of this practice is, that instances have occurred of children being cured of the rickets, when, from the first appearance of that complaint, they have been daily furnished with clean linen, well dried, and occasionally smoked with juniper berries, frankincense, or other fragrant substances, in order to expel the moisture which is absorbed by linen. But if a clean change cannot be conveniently procured every day, the night-shirt, as well as that of the day, ought to be regularly dried."

We were almost tempted to smile at the triteness of some of the remarks, as when the old doctor said that if any of them should experience shiverings, succeeded first by heat and then by sweat, and these should return every second, third or fourth day, they might be certain they had an ague or intermittent fever (p. 25). For the same reason, we were ready to lose our gravity again when he assured them the brain was contained in the head (p. 26); redness of the eye showed that inflammation had taken place there (p. 27); and the food was received and principally digested in the stomach (p. 32). But we were disposed to lay aside our risibility, and be serious again, on perusing the following excellent paragraph (p. 20).

"Nor do I go out of my way when I recommend reading to you; for I recommend it as a medicine which, by its effects on the mind, will secure you from the attacks of some diseases which really originate from the mind not being sufficiently exercised; and also, as a remedy which will better enable you to beguile away the dreary hours of confinement from almost any kind of malady. Nor is this remedy an expensive one, since there is *one volume*, the cheapest in the kingdom, which, whether you seek to be interested by the plain facts of history, by the most pathetic descriptions and situations, or by the most marvellous and even miraculous adventures; whether your taste be for plain prose, or for the most sublime poetry; whether in your youth you search for instructions for obtaining happiness, or in your age, solid and essential comfort, this ONE VOLUME, THE BIBLE, will afford it all."

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Taking this little book into our consideration upon its merits, we are inclined to think its precepts, if observed, may save many a person from disease and ruin. It seems, upon the whole, to be one of those plain and didactic performances, which, without affecting any thing exquisite in novelty, beauty or sublimity, aims at the preferable end of instruction and usefulness. And these purposes may be probably answered in the best manner, if our fellow-citizens would purchase it, and place it on their sofas, parlour windows, and handy places about the house, as a salutary memorandum-book.

MEDICAL & PHILOSOPHICAL NEWS.

DOMESTIC.

TRUE CHARACTER OF THE PLAGUE.

TO compensate for all the distresses brought on humanity by the campaigns in Egypt during the late war, it is consoling to reflect upon the discoveries which have been made by English and French physicians and officers, of the *true nature of the plague.* Among all the writers of both nations, Affalini and Sir Robert Wilson deserve most credit. The latter disproves the old superstitious notion, that this disease is imported from Turkey into Egypt. He proves that it is the effect of exhalation from the putrid matters left by the overflowing of the Nile, and from other liquid and putrid matters in other parts of the country. He says it is communicated by the atmosphere, and that persons recover by being removed from the places where they are affected by it, to an air beyond the reach of putrid exhalation.

He denies its ever being contagious, except under those circumstances of filth and close confinement which now and then render all other fevers liable to become sources of infection. The general belief in these facts is calculated to do away the accumulated evils of ages, which have arisen from a belief of the plague being a specific disease, and kept alive like smallpox, only by being propagated from one person, or one country, to others. Millions of lives have been lost by this error. Sir Robert Wilson does not hesitate to declare that the plague might be annihilated in Egypt, or made a mild disease; and mentions, as the means for that purpose, the use of lime, coals, paving the streets of their cities, the formation of roads, the white-washing of the apartments in every house, the use of well-burnt brick instead of wood in their buildings, and the draining off all stagnant waters. He says the most effectual remedies now employed for its cure are embrocation of the body with sweet oil, and the use of mercury.

An account of some of the facts from which these conclusions concerning the origin and nature of the plague, are drawn, may be expected in our next number.

System of the English Sewers, as conducive to Cleanliness, by removing Nuisances from the surrounding Atmosphere, but not Nastiness from the House and Person: destroying Plague, but leaving Typhus undisturbed.

In contemplating the great leading features of municipal regulations, nothing, says Justice Colquhoun, places England in a situation so superior to most other countries, with regard to cleanliness, as the *system of the sewers*, under the management of special commissioners in different parts of the kingdom, introduced so early as by act the 6th Henry VI. cap. v. and organized by the acts of 6th Henry VIII. cap. x. 23d Henry VIII. cap. v. 25th Henry VIII. cap. x. afterwards improved by the 3d and 4th Edward VI. cap. viii. 1st Mary, Stat. 3. cap. xi. 13th Eliz. cap. ix. 3d James I. cap. xiv. and 7th Anne, cap. x. Sewers being introduced early into London, as well as into other cities and towns, in consequence of the general system, every offensive nuisance was removed through this medium, and the inhabitants early accustomed to the advantages and comforts of cleanliness. This, however, is only cleanliness *out of doors*, and not of the person.

The 11th George III. cap. xxix. contains a complete and masterly system of that branch of the police which is connected with municipal regulations, and may be considered as a model for every large city in the world. This excellent act extends to every obstruction by carts and carriages, and provides a remedy for all nuisances which can prove in any respect offensive to the inhabitants; and special commissioners, called Commissioners of Sewers, are appointed to insure a regular execution. It is further improved by 33d George III. cap. lxxv. by which the power of the commissioners is increased, and some nuisances, arising from butchers, dustmen, &c. further provided against. Yet the great evil of filthiness *within doors*, sticking to clothing, bedding and furniture, is the subject of much complaint and misery, and remains without a remedy.

Mr. Justice Blackstone gives the following account of the courts they are authorized to hold. (3 Commentar. chap. vi.)

"A second species of private courts is that of commissioners of *sewers*. This is a temporary tribunal, erected by virtue of a commission under the great seal; which formerly used to be granted *pro re nata* at the pleasure of the crown, but now at the discretion and nomination of the lord chancellor, lord treasurer, and chief justices, pursuant to the statute 23 Hen. VIII. ch. v. Their jurisdiction is to overlook the

repairs of sea-banks and sea-walls; and the cleansing rivers, public streams, ditches, and other conduits whereby any waters are carried off: and is confined to such county or particular district as the commission shall expressly name. The commissioners are a court of record, and may fine and imprison for contempts; and in the execution of their duty may proceed by jury, or upon their own view, and may take order for the removal of any annoyances, or the safeguard and conservation of the sewers within their commission, either according to the laws and customs of Romney-marsh, or otherwise, at their own discretion. They may also assess such rates, or scots, upon the owners of lands within their district, as they shall judge necessary: and, if any person refuses to pay them, the commissioners may levy the same by distress of his goods and chattels; or they may, by statute 23 Hen. VIII. ch. v. sell his freehold lands (and by the 7 Ann. ch. x. his copyhold also), in order to pay such scots or assessments: but their conduct is under the controul of the court of king's bench, which will prevent or punish any illegal or tyrannical proceedings. And yet, in the reign of king James I. (8 Nov. 1616), the privy council took upon them to order, that no action or complaint should be prosecuted against the commissioners, unless before that board; and committed several to prison who had brought such actions at common law, till they should release the same; and one of the reasons for discharging Sir Edward Coke from his office of lord chief justice was for countenancing those proceedings. The pretence for which arbitrary measures was no other than the tyrant's plea of the *necessity* of unlimited powers in works of evident utility to the public, 'the supreme reason above all reasons, which is the salvation of the king's lands and people.' But now it is clearly held, that this (as well as all other inferior jurisdictions) is subject to the discretionary coercion of his majesty's court of king's bench."

These regulations have done wonders in removing the plague; but the *personal* uncleanness yet subsisting keeps up typhus. This latter source of mischief is not within the power of the commissioners of sewers. Would it not be proper to have inspectors of dwelling-houses, &c. with powers to cause them, with their furniture and clothing, to be cleansed in certain cases? (Med. Rep. vol. v. p. 191 & seq.)

All the reports we read concerning the condition of the British poor agree in their extreme uncleanness, a state almost inseparable from their deplorable indigence. It would answer

the purposes of humanity exactly as pursued by Mr. Bernard, Mr. Bentham, and their worthy associates of the society for bettering the condition of the poor, plentifully to distribute alkaline salts and lime among those wretched creatures. By the use of pearl-ashes, barilla and soap, with some quick-lime, they would do more service in removing and overcoming personal filth and its offspring, infection, in one year, than by the acid fumigations now in vogue, for a century. By these means they would go far towards exterminating typhus, which would then rest with plague and small-pox.

HISTORY OF THE OLEATES OF ALKALIES, OR SOAPS.

The history of personal cleanliness is very important, and has been lamentably neglected. Pliny, in his Natural History (lib. xxviii. cap. 12.) treating of strumous swellings, makes mention of Soap: *Prodet est sapo. Galliarum hoc inventum rutilandis capillis. Fit ex sebo et cinere. Optimus ex fagino et caprino: duobus modis, spissus ac liquidus: uterque apud Germanos majore in usu viris quam fæminis.* "*Soap is good for them. This was invented in Gaul, and used for reddening the hair. It is made of fat and ashes. The best is prepared from the ashes of the beech-tree, and the suet of the goat. There are two sorts, the thick and the liquid. Among the Germans, both kinds are more used by the men than by the women.*" PRISCIAN writes of "Sapo Gallicus," or Gaulish Soap; and MARTIAL, of "Spuma Batava," or *Dutch lather*, and "Spuma Caustica," or *Caustic foam*. The GERMAN Soap was reckoned the best and cleanest. The GAULISH was next in quality and value.

It is clear, and President GOGUET is of the same opinion, (in his History of the Origin of Laws, &c. Book ii. chap. 2.) that the ancient Hebrews, Greeks and Romans knew nothing of Soap. These nations used to supply the want of it by various other means. From the barbarous people of the north, the knowledge and employment of Soap passed to the Romans; and from the Romans, was made known to the Greeks. A very remarkable fact!

When the Romans first became acquainted with Soap, they called it, "Unguentum Cineris," or *Ointment of ashes*. So prevalent was the idea of its origin, that several writers have treated of it under the denomination of "Cinis," or *Ashes* itself. And they who consumed Soap were, in those days, called by the appellation of "Cinerarii," or *Ashes-users*.

After a while, however, this detergent ointment was distin-

guished among the Romans by the word "Sapo." This term is probably of Gothic or Barbarian origin. Some of the Parthian and other nations bordering on the frontier provinces of the Roman empire, distinguished their rulers or chiefs by the name "Sapor," or "Sapores." The good they derived from the *Unguentum Cineris* was so great and excellent, and it was so powerful in overcoming bodily inconveniences, and so conducive to personal comfort, that they called this preserver of private health, by a name corresponding to, and derived from the sovereigns who presided over their public safety. From SAPOR, thus was derived SAPO; two terms significant of the powers which protected the political and the individual bodies of the people. The Romans adopted Sapo, and naturalized it to their language. From them the Greeks borrowed their "σαπων". The French have derived their "Savon" from the same source; and so have the English their "Soap."

But if Soap was so late an invention, and learned from the rougher nations of the north of Europe at so advanced a period of the history of their southern neighbours, how comes it to pass that the Hebrews were acquainted with it, as we read in the English version of the Bible, translated under the auspices of king James? The term "Soap" does indeed occur there in JEREMIAH, chap. ii. v. 22. and in MALACHI, chap. iii. v. 2. Yet there can scarcely be entertained a doubt, that the translators were mistaken. This opinion of their having misinterpreted the text is supported by the Latin vulgate version, which expresses the former of these passages by the words, "herbam Borith," and the latter by "herba Fullonum." What, now, is the *plant Borith*, and what is the *Fuller's herb?* CALMET, in his Dictionary of the Bible, states, that it is the kali or saline vegetable, of whose ashes "ley and soap is made." GOGUET thinks it was Salt-wort, a plant very common in Syria, Judea, Egypt, and Arabia; which, if burned to ashes, and the ashes mingled with water, formed a strong ley fit for cleansing and whitening clothes, (Origine des Loix, &c.) and doubtless they were right.

Notwithstanding all this authority, BEZA evidently missed the true meaning of the original, which he expresses in both the before-mentioned texts, by the substantive "smegma." But JOHAN JACOB SCHMIDT, in his *Biblischer Medicus*, p. 654, mentions this cleansing article by the Hebrew name of "BOR." This substantive being derived from the root "ur," *fire*, plainly indicates, that the purifying material in

question was obtained *by or through fire*. *Borith* would thus seem to be the plant which, by the *action of the fire*, yielded *Bor*, that is, the detergent article of the washers and fullers. Or the two words might be used indifferently, to signify the plant both before and after incineration. Hence it may be inferred, the plant was a species of *Salsola*, or *Glass-wort*, and that the saline residuum, after burning, was *kelp* or *barilla*; a material possessing qualities similar to the oriental natron or mineral alkali. The same thing has been latterly called *Soda*, whence comes *La Soude* of the French, and the *Suds* or Alkaline lixivium of the English.

PHOSPHORIC ACID FOUND AMONG POT-ASH AT THE MANUFACTORIES, WITH THE PROPER REMEDY.

The manufacturers of pot-ash in New-London County, Connecticut, have discovered in their alkali a sort of saline substance, which gives them great trouble, and vitiates their product. When they are boiling down their common ley, this compound salt begins to concrete or crystallize in the kettles sooner than any other, and may be scooped out with the ladle. Its crystals, as taken out of the boiling lixivium, are mostly four-sided pyramids, terminating in quadrangular points. Some of them, however, are six-sided. The sides of these crystals reflect light considerably, and possess a shining appearance. They are not acid, but smell of ley, and have evidently a predominating alkali. They do not attract much moisture from the atmosphere, but decrepitate upon pit coals. Laid upon a red-hot iron shovel, they snap to pieces and fly away.

If this kind of salt abounds in the kettle, the workmen find it almost impossible to melt the alkali so as to make good pot-ash. Though they raise a very violent heat, the mass remains refractory, and does not fuse well. Frequently, during the high fluxing heat, a considerable blaze flashes round the sides of the kettle; and even then the materials do not melt so completely as in their ordinary state, and when cooled they are not so good coloured, but are darker.

Pot-ash, charged with this material, is so vitiated for the common purposes for which alkaline salts are employed, that it is rendered very unsaleable, and, consequently, is of little value.

A sample of this salt was sent to Dr. Mitchill by Zenas Strong, physician, of New-London county, for examination, in June, 1803. Dr. Mitchill found it to possess no great

share of sapidity, and no pungency at all. It was readily soluble in water. The solution was by no means unpleasant to the taste. But on adding lime-water to a transparent solution of it, there was an opacity immediately produced. The small particles which were first visible soon gathered into larger clouds, and fell gradually to the bottom. The liquor became clear again, and instead of possessing the quality of neutral salt, was strongly alkaline. Hence Dr. Mitchill concludes that the acid is the phosphoric. Being attracted by the lime from its association with the pot-ash, it is precipitated with the former as a new combination, to wit, phosphate of lime; while the liberated alkali appears in the form of a ley, or solution in water. M. Carendeffez thinks there is some sulphuric acid present, because on adding muriate of barytes a cloudiness immediately is produced.

To remedy the inconvenience and loss sustained by the manufacturers, Dr. Mitchill has recommended the addition of calcined lime to the ashes in the letch-tubs and vats; under the conviction that the pot-ash will be instantly freed, by this means, from all admixture of phosphoric acid, before the ley is put into the boilers, and, consequently, that all inconvenience and damage from this cause may be prevented, in a cheap, easy and expeditious manner.

And to prevent the admixture of phosphoric acid entirely, he recommends that the ashes be kept in such a manner that no urine can be sprinkled upon it; for from urine the chief part of the phosphoric acid is probably derived.

COMMERCE OF THE UNITED STATES WITH FOREIGN PARTS IN SEA-SALT.

The salt-trade of the United States is very important. The greater proportion of this necessary article is imported from foreign parts. Though the salt springs in New-York, in Ohio, in Indiana, Kentucky, Tennessee, and in other places, furnish the interior country with large quantities of muriate of soda, still it is a fact, that by far the greater proportion of the salt consumed in the United States is brought from abroad. The amount of salt imported from the 1st October, 1800, to the 30th September, 1801, was as follows:

In vessels of the United States	48,582,813 pounds.
In foreign vessels	15,245,070
Grand total in pounds	63,827,883

In vessels of the United States	1,607,805	bushels.
In foreign vessels	534,475	
Grand total in bushels	2,142,280	

The reason why part of the salt is reckoned in pounds and the remainder in bushels is this: all imported salt being subject to duty, the revenue law declares, that whenever a bushel of salt weighs more than half a hundred weight, or 56lbs. the impost shall be calculated and collected on each parcel or quantity of 56lbs. and when the bushel weighs just 56lbs. or less, the impost shall be levied on the bushel. Hence, if the number of pounds be divided by 56, the quotient will be the number of bushels: Thus, 56÷63,827,883=1,139,783.

Then bushels 1,139,783, added to
2,142,280, make

3,282,063, as the aggregate amount of salt imported from foreign parts, and landed in the United States, during the above-mentioned twelvemonth.

Of this salt, 16,612,938 *pounds*, and 972,739 *bushels*, are brought from England. The pounds, reduced to bushels as before, give 296,659, which, added to
972,739, make

1,269,398, as the sum total of the salt imported from that part of Great-Britain called England; none having been brought from Scotland, and only a very few bushels (76) from Ireland. Whence it appears, by absolute calculation, that *one-third of the salt imported into the United States, and* 175,377 *bushels in addition to that third, is exported to our country from England.* This is chiefly, if not wholly, of English manufacture.

The British salt imported into the United States comes chiefly from Cheshire, from the mines which contain it. It is found there near Northwich. The first was discovered by accident, in boring for coal in 1670, by one John Jackson. The Bishop of Landaff went to the bottom of them, and thought his labour well rewarded. The Northwich rock-salt mines are superior to those of Cracow, with respect to the quantity of salt annually raised. For a single pit at Northwich yielded at a medium 4000 tons a year, which amounts itself to two-thirds of the annual quantity raised in the Polish mines. A great quantity of the Northwich salt is sent coastwise to

Liverpool and other places, particularly to Holland and Ireland. Rock-salt, and the white salt which is made from it, are exported free from duty; and the quantity exported from Northwich is so great, that if it was charged with the salt duty it would produce to the government a revenue of about four hundred thousand pounds per annum. Northwich rock-salt is never used in its crude state at table; and the employment of it for pickling or curing flesh or fish, or preserving any provisions, without being previously dissolved in water, and boiled down into white salt, is prohibited under a penalty of forty shillings for every pound of rock-salt so applied. They use this rock-salt for strengthening brine-springs or sea-water preparatory to boiling down. By this operation the people on the Mersey, instead of one ton of salt from forty-eight tons of sea-water, can obtain, by saturating ocean-water, four tons of salt from the same quantity of brine so made. The white fine salt is prepared by a boiling heat. Sea-water, brine-springs, and rock-salt, generally abound with various other earthy and saline ingredients, such as lime, magnesia, Epsom salt, gypsum, Glauber's salt, &c. all of which injure the quality of the salt, and disqualify it for preserving animal flesh every where, but especially in hot countries and seasons. Therefore this British salt, which chiefly comes to us from Liverpool and the Mersey, is a most pernicious article of import. It is both weak and impure. And, deceived by its fair and tempting appearance, the Americans have used it for curing their fish, beef, pork and butter. In such cases these kinds of provisions have generally spoiled and become putrid. The septic gases exhaling therefrom poison the atmosphere of our cities and ships, and infect the people with pestilential diseases: the way to avoid which is to avoid Liverpool salt.

There are other sources whence the American States derive their sea-salt besides England; to wit:

From the Swedish West-Indies 538,624 pounds, and 2819 bushels. From the Danish West-Indies 711,509 pounds, and 6350 bushels. From the Dutch West-Indies 587,160 pounds, and 12,458 bushels; from the Dutch East-Indies 929,405 pounds, and 10,483 bushels. From the British West-Indies 17,165,708 pounds, and 149,768 bushels. From the British American Colonies 40,648 pounds, and 11,246 bushels. From the French West-Indies 694,331 pounds, and 5702 bushels. From Spain 196,896 pounds, and 16,474 bushels. From Teneriffe and the other Canaries 1416 bushels. From the Spanish West-Indies 1811 bushels. From Floridas and Loui-

siana 116,011 pounds, and 4421 bushels. From other Spanish American Colonies 6888 pounds. From Portugal 5,772,124 pounds, and 207,972 bushels. From Madeira 19,654 bushels. From Cape de Verd Islands 5,149,299 pounds, and 177,331 bushels. From Italy 61,272 pounds. And from Europe generally, and uncertain ports, 650 bushels.—(Mr. Nourse's Treasury Statements, &c. 7th Feb. 1803.)

These kinds of salt, any, indeed, that we import besides that from Liverpool, may be employed with safety in preserving animal flesh for food. But that British salt which they make to sell abroad, and not to consume at home, ought to be shunned as a most pernicious thing in trade, and the cause of incalculable sickness, death, and loss of property among the American consumers.

As soon as the use of British salt is discontinued, there will be less corruption of the provisions which form so great a part of our West-India exports; there will be less septic and venomous air engendered in the vessels which convey and contain them; there will be proportionally less sickness and mortality from their mischievous agency; and, of course, there will be less and less noise about importing yellow fevers, &c. from the tropical latitudes. Thus, by degrees, we shall learn not to blame the West-Indies for our own misdoings. The evil chiefly lies at home, and in our own vessels, and this is one of the modes of correction and prevention.

Facts to prove the local Generation of pestilential Poison on Board a British Ship in the Harbour of New-York, in the Month of July, 1803.

These facts go to show the production of pestilence on shipboard; and while they evince the miserable, and it may be added, the criminal neglect of ship-masters, teach us the necessity of purifying every nasty part of a vessel by water, air and alkalies. In the case about to be mentioned, poison was produced within the vessel from filth which had been transported from a port in Great-Britain to the port of New-York. There is no contagion (as we define the term) or secreted morbid venom in any part of the occurrences, nor have our fellow-citizens any reason to say, that they imported yellow fever from the British channel, any more than that the people of that part of the world imported it from Long-Island Sound.

The British three-decked ship Hibbert, of about six hundred tons, came from Portsmouth, (England) in ballast, and the

agent at New-York, pursuant to instructions, ordered her to be loaded with pine-timber for the Bay of Honduras.

About the 20th of July, 1803, while the people were employed in clearing away the rubbish and stuff between decks and below, it was observed, that she contained a quantity of sand-ballast, which had remained there a number of years without being changed. It was, however, not taken out nor shifted. As little stir was made among it as possible, but it was covered over as fast as business would permit, with deal boards and staves. The space being filled with these materials, the lower hatches were carefully caulked.

Previous to filling the space between the lower and middle decks, it was necessary to have some scraping and overhauling done there. The persons employed in this service found the deck and timbers overspread with all manner of corrupt and excrementitious materials. The stench occasioned by the collection and removal of this trash and offal was intolerable. The men were obliged to flee to the port-holes and hatches for fresh air. Some of the common labourers declared, that nothing but the absolute want of the necessaries of life could make them continue in such employ. This part of the pestilential filth was thrown overboard beside the wharf (it not being convenient to caulk that down too) into the salt-water; but in performing this the whole ship became offensive.

In the mean time, several persons on board began to be sick. In receiving and stowing the loading, the sailors were assisted by several labourers from the city. One of the seamen, after two days illness, had symptoms of hæmorrhage and black vomit, and was sent to the marine hospital, where he died. A boy was taken out unwell, and also sent to Staten-Island. The stivadore who loaded the ship was poisoned by the effluvia, and died after hæmorrhage and black vomit, at his house in the city, early on the fourth day after seizure. Another of the crew had a slight sickness of the stomach; and a lad who had been employed on board to keep an account of the lading, complained also of head-ache and qualmishness.

These events excited some uneasiness, and led to a strict inquiry, when the following facts came out. The ship had been used as a transport for soldiers; she had sailed in October, 1802, with a regiment from Portsmouth, to Halifax, Nova-Scotia; thence she had carried another regiment to Nassau, in the Bahamas; from that place she conveyed the third regiment home to Portsmouth; afterwards she had been dispatched to New-York in ballast as before-mentioned. During this quadruple

voyage, she had collected an uncommon amount of nastiness and venom, and had never been cleansed. And so, as is every day, and almost without fail, the case with ships and vessels, she carried her abominable and deleterious contents wherever she went.

There was so much offensive nastiness in this ship, that a Physician who went on board declared, he could with difficulty refrain from vomiting, on account of the filth of the great cabin; and all this venom was of British manufacture, and produced the above-mentioned effects, both upon them and our own inhabitants, when there was the most complete state of health on shore. Nobody took the disease from the sick.

Nothing is more common with the English physicians and philosophers, than to talk of the unhealthiness of foreign countries, compared with the unequalled salubrity of their own. There is more self-love than correctness in this. It is true, indeed, that the English are very prone to be sick in hot climates; but it is equally true, that, in many cases, the natives of those climates are in the enjoyment of high health at that very time when yellow fevers are cutting off their visitors. In the instance of the ship just related, it is clear that British nastiness, accumulated by British subjects, in a British ship, did turn to pestilential gas in the harbour of New-York, and excite yellow fever, both among the crew and the inhabitants of the city who went on board to work; and this at a time when nothing of the kind existed on shore. The like constantly occurs in their West-India and African voyages, and they lay the mischief on the climate or the natives. What happened in this instance is, therefore, of frequent occurrence on board the vessels of that commercial, warlike and enterprizing nation wherever they go. If the facts were investigated with the minuteness and care which has been bestowed on the Hibbert, it would be found that foreign countries are not to be blamed for the sickness that people suffer, so much as their own shocking nastiness. This, however, being a quality they will never acknowledge, they cast the blame upon foreign people. This they may continue to do in the ports of Africa and Asia, but in North-America, they may rely upon it, a more vigilant eye will be kept upon them, and when their vessels poison us, we will tell them of it, from time to time.

At the time of the ship's lying at the wharf, within a few yards of Dr. Mitchill's house, the weather was very hot, being from 85 to 93 degrees of Fahrenheit's thermometer in the shade, during the shining of the sun. At the same time, the

heat of the fluid in which the ship floated, being salt tide-water of the ocean, was no greater than 73 ½ at the depth of ten feet below the surface. Consequently the poisonous ballast, and other pestilential materials which were contained in the bottom, and on the orlop-deck, approximating in temperature to the coolness of the surrounding water, might have remained in a state of inaction or slow fermentation, if parts of them had not been stirred and brought to an hotter region. Immediately on moving and bringing the horrid ingredients forth to a place where they might undergo brisker intestine motion, turn to septic venom, and be diffused through the neighbouring atmosphere, they produced their accustomed effects, by exciting yellow fever, with black vomiting, or some other symptoms, in the constitutions of all who were predisposed to be acted upon by their exhalations.

These facts present an instructive lesson. The filth in this vessel had been a long time accumulating, from an inattention and ignorance of consequences which are extremely common in mariners, and cannot be too severely condemned. While the vessel was on the ocean and in the British port, no noxious exhalations were evolved, because the degree of heat was insufficient for this purpose; of consequence, the crew were healthy, and continued unsuspicious of the mischief which was lurking on board. But arriving at New-York in the midst of an unusually hot summer, and no care being taken to guard against the evil, the violent heat of the sun operating on such a mass of filth, formed and set loose the fatal gas whose effects we have mentioned above.

MEANS BY WHICH DISEASES FROM HARD DRINKING AND VENEREAL VIRUS ARE PROMOTED.

When the inquiry into the consumption of distilled spirits in New-York was made, about a year ago, (see Medical Repository, vol. vi. p. 333.) there were 1,200 houses in the city, where rum and other strong liquors were sold by retail or small measure. The number is now increased to about 1,400: and this excess of tavern licences is allowed, in a population which, according to the census for 1801, contained 60,489 inhabitants of all ages, sexes, and conditions; though the number of people is probably increased several thousands within the time which has elapsed since the census was taken.

By Governor Montgomerie's charter to the city of New-York, dated January 15, 1730, and confirmed by an act of Assembly, passed October 14, 1732, the power of granting

licences annually to all such persons as shall keep taverns, inns, ordinaries, and victualling-houses, or sell wine, brandy, rum, strong waters, cyder, beer, ale, or any other exciseable or strong liquors within the city, its liberties or precincts, by retail, is vested in the Mayor for the time being, and no other whatsoever. To him is conceded the privilege of granting licences, under the public seal of the said city, to all such persons as shall think fit to keep public houses, or to sell liquors by small measure. For each licence, it is lawful for him to demand and receive a sum not exceeding thirty shillings. The money, as collected, to be for the public use of the Mayor, Aldermen, and Commonalty of the city.

By the 36th article of the State Constitution, ratified April 20th, 1777, the charters, from the king of Great-Britain, made prior to October 14, 1775, to bodies politic, are recognized and allowed to be in full operation. In consequence of which, the Legislature, in providing for the limitation of licences, and the qualifications of those to whom they are granted throughout the Commonwealth, have forborne to direct any thing concerning these matters within the city and county of New-York, for fear of trespassing on chartered rights; and thus the metropolis remains an exception to the rule, governing all the rest of the State. The Mayor, for the time being, licenses as many as he pleases, and is not obliged to require that they should have spare-beds, horse-provender, or the means of accommodating travellers or their beasts. Thus the number has gradually increased to fourteen hundred houses, where spirituous liquors are sold by retail; and the habit of drinking is such as to make this a very profitable business.

For example, a retailer may buy brandy by the puncheon, and can add water enough to reduce it to the retail proof, and sell it at one dollar and an half by the gallon. By this operation, he makes the customary profit of $33\frac{1}{3}$ per cent. on his sales; but if he sells it out by the gill, and mixes it with water into grog, he charges one-sixteenth of a dollar per grog, which (at thirty-two gills to the gallon) advances the price to two dollars. At this rate, an incredible quantity is sold to the consumer.

In New-York, bawdy-houses are known to exist, and to be connived at by the magistrates, and by society. This toleration virtually amounts to a licence. But though licensed by common consent, they are under no regulation of the Health Office, nor subjected as such to any restraint by the municipality. A common prostitute is only punishable under the law concerning disorderly persons, and her entertainer is under no fear but that

of losing his tavern-licence for keeping a disorderly house. In consequence of this faulty and defective system of police, the venereal disease is kept constantly in action, and diffused far and wide among both sexes. The amount of this evil may be judged of, in some degree, by the following extract of a letter from that able and vigilant magistrate, Jacob De la Montagnie, Esq. one of the Justices of the New-York Police, to Dr. Mitchill, dated July 18, 1803. "I present you with as accurate "a statement on the subject you mentioned to me yesterday, "as the shortness of time will permit: I believe it to be toler- "ably accurate. Of this, however, I am pretty certain, that "it is considerably within the bounds of truth.

"Common prostitutes, openly and notoriously so, at least 1050
"Common bawdy and dancing-houses, frequented by prostitutes and disorderly persons, 160
"Common prostitutes, committed under the vagrant act during the year ending December 31, 1802, 504
"Male disorderly persons, commonly called vagrants, committed under the same act during the said period, 263"

In this enumeration, there is no account of the demireps, kept mistresses, and private concubines. But an adequate and alarming idea may be formed of the number of manufactories of syphilitic poison, and of the baneful influence it exerts upon the human frame, in its wide circle of diffusion.

It is computed, that the population of London amounts to 1,250,000 inhabitants, of whom 50,000 are women, living wholly, or in part, by prostitution. The population of New-York is 60,000 and upwards, of whom 1050 are public strumpets. In London, these frail sisters make one twenty-fifth part of the inhabitants. In New-York, the notorious members of the same class amount to more than one-sixtieth. Yet, when it is estimated that at least an equal number is engaged in clandestine and cryptogamous practices of a similar kind, though not publicly found out, the whole sum of these women will amount to 2,100. And this, upon the estimation that the population has increased to 63,000, will exactly amount to one in thirty only of the residents. So New-York is not yet *quite* a match for the British metropolis.

REMARKABLE PHENOMENA OF THE LATE SPRING OF 1803.

The winter of 1802-3, though not so intensely severe as has been frequently felt, was, upon the whole, cold and tedious. There was not so much snow as usual in the Northern States. In the Southern there was more winter than common.

The Potomack was frozen over so as to bear travelling at Georgetown, and so was the Susquehanna at Havre de Grace. At Washington Dr. Mitchill repeatedly observed the quicksilver of Fahrenheit's thermometer, suspended from his chamber window by a piece of tape, fall as low as 14 deg. above zero. The spring was chilly, though not accompanied with more than ordinary frost until May. Vegetation, during this time, had progressed so far as to adorn the whole country with verdure and blossoms. The apricots had dropped their petals, and young fruit as large as small peas had succeeded. The earlier varieties of the peach had advanced beyond the time of perfect flowering, and had also bestrewed the ground with their petals. Cherry-trees and apple-trees were in full bloom, and there was a very fine and promising prospect of fruit.

Many stationary birds, and such as migrate hither from the south, had built their nests, and were breeding. But several species of ducks that fly northward to pass the summer and rear their young, were still hovering along the coast, detained by the cool weather and adverse winds.

Though there had been several freezing nights, yet on the 4th of May, 1803, the air was so cold, that, during the night, there was a more considerable frost, and water in troughs and puddles was turned to ice as thick as a pane of glass. On the 5th there was a plentiful fall of rain, accompanied with a N. E. wind, which lasted until the 6th, and then cleared away. The night of the 6th was yet colder; for besides the congelation of water to thicker ice, there was a frozen crust, on the morning of the 7th, in gardens and ploughed grounds. This day, the weather being clear, the farmers in the vicinity of Plandome were engaged in planting their Indian corn.

In the afternoon the air grew colder, and a gathering of clouds appeared in the S. W. Some of the weather-wise people predicted snow. The stars, however, continued to shine in the zenith until after eleven P. M. The horizon was cloudy, and the clouds thickened and rose, particularly in the S. W. By midnight, the wind, which had been blowing from the N. W. and afterwards from the S. W. in the afternoon, blew from the N. E.

This wind was accompanied with so much snow, that by day-break on the 8th the face of the earth was covered with it as in winter. The contrast which it made with the verdure of the trees and fields was singular. The expanded blossoms were filled or covered with snow; and May seemed all of a

sudden transformed to December. The snow continued to fall in large flakes, and copiously, until eleven A. M. when it was entirely turned to rain. It was judged that, had this snow fallen on frozen ground, and thereby had been prevented from melting as it fell, there would have been excellent sleighing. The earth would probably have been covered to the depth of six inches or more. By ten in the morning of the 8th it had turned to sleet, and gradually abated until about one P. M. when the snow ceased to fall.

This snow extended as far south as the Potomack.

This spring was remarkable for another meteorological occurrence. The Aurora Borealis, which has been frequent for several years, appeared, with considerable brightness, several times about the middle of March; but not with the frequency, luminousness, extent, noise and variegated colours which it used to exhibit between the years 1780 and 1792.

On the 21st day of April there was another appearance which attracted much attention in New-York. A star was visible between eleven and twelve o'clock in the morning. The moon being in her last quarter, and the sun near his meridian, the three bodies were visible at the same time, and not far from each other. The star was apparently the planet Venus in her greatest elongation from the sun; or rather in her perigee, or nearest approach to the earth. If her period, however, is octennial, and if she was thus visible by day-light in 1780, in 1788, and 1796, how has it happened that she could thus anticipate her time by a twelvemonth, and be visible during bright sunshine before 1804? Our astronomers may consider this.

On the 29th of May the weather was so cold that an extensive and severe black frost prevailed over the country, and fires were very necessary until this time in parlours.

On the 1st of June there was a shower from the N. The gust was exceedingly boisterous and violent, and the wind, when at the height, veered all around the compass in a few minutes. It was attended with black clouds and sharp lightning and thunder. With the rain there fell a considerable quantity of hail. The pieces were roundish, and about the size of small cherries. Some were much larger. Many of them were of a whitish or snowy opacity throughout; and others contained a nucleus of congealed snow in the centre. They fell with such violence at the city of New-York as to break windows. The time was between three and four P. M. The shower lasted about three quarters of an hour. A parcel of them

were collected in a tumbler-glass, and brought into the parlour. The temperature of the room was 71 deg. and in that heat the hail-stones were about an hour and an half in melting.

Dr. Mitchill having, in his Theory of Hail, given reasons and authorities for this kind of congealed water being tinctured with an acid (see iii. Med. Rep. p. 91 & seq.), took the present opportunity to try whether this was the fact. He gathered a sufficient quantity of hail-stones as quickly as possible after their falling to the ground, and put them in a glass to melt. This vessel of water was put away in his library, with a piece of litmus-paper in it. Next morning the litmus-paper was turned red, giving evident signs of acidity in this hail-water. The experiment was repeated, and with the same result. The blue colour was turned, after a few hours immersion, to a red. To be sure that there was no deception, a little powder of dried carbonate of soda was added to the water, and suffered to slide down the paper as it stood aslant in the vessel; and as soon as the alkali was dissolved, the former blue colour was restored to the paper. Thus there could be no doubt that the water of melted hail contained an acid weakly distributed through it.

And yet, notwithstanding all this cold, with snow and hail, strawberries, cherries, raspberries and currants were as plentiful as usual; and plenty of young peaches and apples appear on their respective trees.

ORNAMENTAL FOREST TREES.

In exchange for the numerous vegetable productions which the eastern continent has borrowed from America, many valuable plants have been received. To say nothing of the apple, quince, peach, cherry, &c. which refresh us with their fruit, it is our intention, at present, to mention two trees of the forest, which, though not natives of the western hemisphere, are become very common and ornamental in many of the States. The trees alluded to are, the Lombardy poplar and the Babylonian willow. The first of these (a variety of the Populus tremula) was brought into Pennsylvania about the year 1789 or 1790, and soon after, a cutting of the size of a common graft was brought to New-York, by Mr. Prince, who, to preserve it, stuck one end in a potatoe. It has since become very numerous in many parts of both town and country. The second of these trees (the Salix Babylonia) has also grown very frequent, and is cultivated in the same grounds and plantations with the former. Planted alternately in the same rows and

walks, the upright spiry form of the poplar makes a highly agreeable contrast with the pendulous and drooping appearance of the willow. The quickness of their growth has, within ten years, enabled many proprietors to improve their shores, banks, lanes and margins in a very elegant manner; so that the Hudson and the Delaware equal, perhaps, the lands on the Po and the Euphrates.

Both the Populus and Salix are diœcious plants; that is, vegetables of that peculiar constitution, that, like unto hemp, the bay-berry and the juniper, the male and female blossoms are produced on different trees. The consequence of this is, that there must be a due admixture of male and female trees, to enable the fruit to ripen and be prolific. Unless the staminal dust of the male blossoms is conveyed to the pointal and germ of the female flowers, the seeds will remain, like addle-eggs, destitute of energy, and incapable of vegetating.

There seems to be a provision made by nature against the infecundity which might happen from the accidental separation of the individual trees of these species from the neighbourhood of their mates. Though placed beyond the reach of the floral influence, and having no increase by fructification, they can perpetuate their kind abundantly, without the aid of seeds. Their branches are so vivacious, and grow so easily and luxuriantly from cuttings, that it would not be worth the while to plant the seeds if we had them.

This is probably the poplar which has been rendered famous by the ingenious fancy of the Roman poet, Ovid. He relates that the sisters of Phæton, while bewailing the untimely death of their brother, who had been thrown headlong from the chariot of the sun, and drowned in the river Eridanus, or Po, were metamorphosed to trees. The classical critics are universally agreed that these were poplars. Hence our attention, as we behold these beautiful productions, is drawn to the fair damsels Phæthusa and Lampetie, whose fate has been so pathetically described (Metam. lib. ii. v. 325). The belles of Fredon may hence learn to avoid unavailing and excessive sorrow.

The condition of the weeping or Babylonian willow is peculiar. It is an Asiatic plant, and is probably the very tree on which their harps were formerly hung by the Jews while held captives by the Babylonians. Psalm cxxxvii. 2. In transplanting it from its native regions to the west, the male seems to have been left behind. At least, as far as our examination has gone, and we have taken some pains to search, we have found none but *female* willows in our plantations. This is a

curious occurrence: and it would be a matter of botanical curiosity to import the males from Asia, or possibly from Europe, and plant them in the society of the other sex. Both might probably be comforted and improved by the measure! Doubtless the selection of this species of willow for the emblem or accompaniment of sadness and mourning, in our modern devices and designs, may be traced to the custom of the enslaved Israelites to weep and indulge their grief under trees within the Babylonish territories, as related in the above quoted scripture.

MASSACHUSETTS ACADEMY.

At a late meeting of the *American Academy of Arts and Sciences* at Boston, the following gentlemen were elected officers for the year ensuing:—Hon. John Adams, LL. D. President; Rev. Joseph Willard, D. D. Vice-President. Hon. Robert T. Paine, Francis Dana, Benjamin Lincoln, Esquires; Rev. John Lathrop, D. D. John Warren, M. D. Hon. Cotton Tufts, Esq. Caleb Gannett, Esq. Hon. Loammi Baldwin, Esq. Mr. Samuel Webber, Rev. Simeon Howard, D. D. Counsellors. John Davis, Esq. Recording Secretary. Hon. John Q. Adams, Corresponding Secretary. Rev. James Freeman, Treasurer. Dr. William Spooner, Vice-Treasurer. Rev. John Lathrop, D. D. Librarian and Cabinet-keeper.

The following were elected members:—Hon. Oliver Elsworth, of Connecticut; Josiah Quincy, Esq. of Boston; Hon. Timothy Bigelow, of Groton; Rev. Abiel Holmes, of Cambridge; Rev. William Emerson, of Boston; Dr. James Thatcher, of Plymouth; the Marquis of Lansdown and the Duke of Norfolk, of Great-Britain.

LOFLING'S AMERICAN MANUSCRIPTS.

It has been published in London, that the manuscripts of the Swedish naturalist, Mr. Löfling, are about to be published in Spain. Löfling was one of the disciples of Linnæus, and went abroad in quest of botanical information. After having made a journey through Spain, and communicated what he observed in his *Iter Hispanicum*, which was published at Stockholm in 1758, it is said that he came to South-America, to explore its vegetables, and there ended his days. His papers have been lately found, and transmitted to Madrid, where they will be printed under the eye of Mr. Cavanilles, director of the Royal Botanical Garden. From them may be expected something well worthy of being known concerning those parts of America which Mr. Löfling visited.

EXOTIC PLANTS NATURALIZED TO THE WEST-INDIES.

The indefatigable exertions of Mr. Anderson have tended to introduce into the British West-India Islands many of the valuable exotics of the South-Sea and East-Indian Islands. The cinnamon and cloves which he has lately sent to the Society established in London for the encouragement of Arts, Manufactures and Commerce, bid fair to equal, and to be valuable auxiliaries to those produced in the east. Cloves raised in Cayenne were, for the first time, advertised for sale at New-York on the last of April, 1803. They are highly flavoured, aromatic and fine.

The Hon. Joseph Robley, Governor of Tobago, has raised, it is said, from three bread-fruit trees, between October, 1800, and August, 1801, one hundred and fifty-three young ones, which are now in a flourishing state. He expects the three year old trees will furnish him about twenty plants per month, and that he shall soon complete a plantation he has begun, intended to contain 1300 trees, which he thinks will support about 1000 negroes in the article of bread.

AMERICAN BOTANY.

A second volume of a work on the plants of Peru has been published, under the title of *Flora Peruviana*. It is said to be equally valuable to botanists as the first, and to contain many new and rare species.—M. Michaux has published, in Paris, his account of the vegetables of North-America, under the title of *Flora Boreali-Americana*.

Further Ravages of the Wheat-Insect, or Tipula Tritici of America, and of another Species of Tipula in Europe.

It seems to be now understood that this destructive little animal is a *Tipula*. In the entomological system of Linnè, this genus belonged to the *Diptera*, or two-winged order of the class of insects. But in the arrangement more recently adopted by the distinguished Professor Fabricius, of Keil, it is placed in his eleventh order, or the *Antliata*. Of this genus, his disciple, Frederic Weber, enumerates ninety-four species in his *Nomenclator Entomoliguus*, published at Keil in 1795.

We are not positively informed whether this is an undescribed creature. Though we have often seen and examined it, we still hesitate to decide on so nice a point as pronouncing whether, in so numerous a family, this is a new individual. Though we have confined in boxes and bottles the sluggish Crysalis while sleeping in the straw, and have witnessed his

curious occurrence: and it would be a matter of botanical curiosity to import the males from Asia, or possibly from Europe, and plant them in the society of the other sex. Both might probably be comforted and improved by the measure! Doubtless the selection of this species of willow for the emblem or accompaniment of sadness and mourning, in our modern devices and designs, may be traced to the custom of the enslaved Israelites to weep and indulge their grief under trees within the Babylonish territories, as related in the above quoted scripture.

MASSACHUSETTS ACADEMY.

At a late meeting of the *American Academy of Arts and Sciences* at Boston, the following gentlemen were elected officers for the year ensuing:—Hon. John Adams, LL. D. President; Rev. Joseph Willard, D. D. Vice-President. Hon. Robert T. Paine, Francis Dana, Benjamin Lincoln, Esquires; Rev. John Lathrop, D. D. John Warren, M. D. Hon. Cotton Tufts, Esq. Caleb Gannett, Esq. Hon. Loammi Baldwin, Esq. Mr. Samuel Webber, Rev. Simeon Howard, D. D. Counsellors. John Davis, Esq. Recording Secretary. Hon. John Q. Adams, Corresponding Secretary. Rev. James Freeman, Treasurer. Dr. William Spooner, Vice-Treasurer. Rev. John Lathrop, D. D. Librarian and Cabinet-keeper.

The following were elected members:—Hon. Oliver Elsworth, of Connecticut; Josiah Quincy, Esq. of Boston; Hon. Timothy Bigelow, of Groton; Rev. Abiel Holmes, of Cambridge; Rev. William Emerson, of Boston; Dr. James Thatcher, of Plymouth; the Marquis of Lansdown and the Duke of Norfolk, of Great-Britain.

LOFLING'S AMERICAN MANUSCRIPTS.

It has been published in London, that the manuscripts of the Swedish naturalist, Mr. Löfling, are about to be published in Spain. Löfling was one of the disciples of Linnæus, and went abroad in quest of botanical information. After having made a journey through Spain, and communicated what he observed in his *Iter Hispanicum*, which was published at Stockholm in 1758, it is said that he came to South-America, to explore its vegetables, and there ended his days. His papers have been lately found, and transmitted to Madrid, where they will be printed under the eye of Mr. Cavanilles, director of the Royal Botanical Garden. From them may be expected something well worthy of being known concerning those parts of America which Mr. Löfling visited.

EXOTIC PLANTS NATURALIZED TO THE WEST-INDIES.

The indefatigable exertions of Mr. Anderson have tended to introduce into the British West-India Islands many of the valuable exotics of the South-Sea and East-Indian Islands. The cinnamon and cloves which he has lately sent to the Society established in London for the encouragement of Arts, Manufactures and Commerce, bid fair to equal, and to be valuable auxiliaries to those produced in the east. Cloves raised in Cayenne were, for the first time, advertised for sale at New-York on the last of April, 1803. They are highly flavoured, aromatic and fine.

The Hon. Joseph Robley, Governor of Tobago, has raised, it is said, from three bread-fruit trees, between October, 1800, and August, 1801, one hundred and fifty-three young ones, which are now in a flourishing state. He expects the three year old trees will furnish him about twenty plants per month, and that he shall soon complete a plantation he has begun, intended to contain 1300 trees, which he thinks will support about 1000 negroes in the article of bread.

AMERICAN BOTANY.

A second volume of a work on the plants of Peru has been published, under the title of *Flora Peruviana.* It is said to be equally valuable to botanists as the first, and to contain many new and rare species.—M. Michaux has published, in Paris, his account of the vegetables of North-America, under the title of *Flora Boreali-Americana.*

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We are not positively informed whether this is an undescribed creature. Though we have often seen and examined it, we still hesitate to decide on so nice a point as pronouncing whether, in so numerous a family, this is a new individual, Though we have confined in boxes and bottles the sluggish Crysalis while sleeping in the straw, and have witnessed his

transformation into the winged and active state, yet we decline to give a positive opinion.

During the cold and dry spring of 1803, these creatures again infested the wheat more than they had done for several years. Many crops were cut off early in June, and the ground ploughed up for other purposes. For a careful and detailed collection of facts relative to the Tipulæ, and their manner of breeding in growing wheat, and destroying it, the reader is requested to peruse Mr. Havens's memoir in the New-York Agricultural Transactions, as preferable to any piece on the subject that has fallen under our observation.

There are few branches of natural history so much neglected, or, at the same time, so worthy to be cultivated, as that of insects. These numerous enemies are devouring us on all sides, and seem to be rapidly on the increase. Will no cultivator attempt to lessen their numbers and ravages, by attending to their food, haunts, habits, and time of hatching? Can no REAUMUR be found among the rich and well educated proprietors of our soil, to give an historical account of them? Ought not farmers to cherish, with the most friendly protection, those species of birds which feed upon insects, and thus avail themselves of their instincts for food to destroy these desolating swarms? The field is, perhaps, too great for any individual. But if any gentleman, dwelling in the country, would write but the history of a single insect, he would make a valuable addition to our stock of knowledge, do great service to society, and secure for himself extensive and lasting reputation.

The history of a wheat insect has also been given, as we understand, by the Rev. Mr. Kirby, in a memoir printed in the fifth volume of the Transactions of the Linnæan Society. He has treated of it as a non-descript, and has characterized it in these words, to wit: *Tipula (tritici) rufo-fulva; oculis nigris; alis lacteo-iri-coloribus margine pilosis.* The female is said to resemble the Tipula *immaculata* of Fourcroy and Villars, though there is a difference discernible enough on comparison; and Mr. Kirby also says he has never seen the T. tritici in gardens, whereas the other species seems to inhabit no other places. And the prismatic hues visible on the wings of the new T. are not alluded to in the descriptions given of the *immaculata.* But whether Mr. Kirby's insect is new or not, it is not the animal which has been so greatly injurious to the Fredish farmers, for this latter infests the stalk and vaginal leaves, while the former nestles in the fructification and ear.

PRIZE QUESTIONS.

With the beneficent and laudable view of improving the art of medicine, and to excite practitioners to bring those talents to light which might otherwise be useless to the community, Ward Nicholas Boylston, Esq. hath, by an instrument under his hand and seal, given to the President and Fellows of Harvard College, in Cambridge, bearing date January 20, 1803, empowered and enabled that corporation to appoint, annually, a committee, skilled in subjects connected with medical science, to propose annually sundry questions upon such medical, anatomical, physiological or chemical subjects, as they may deem most useful; and the several authors of the best dissertations (in the judgment of a majority of said committee) upon each of said subjects, which shall be transmitted or delivered to them on or before the 20th November next, after public notice given of said questions, are entitled to receive of this committee a prize medal (or the amount in money, at their option) of such value as to said committee shall seem proper; provided the value of all the medals distributed, and money thus paid, in any one year, shall not exceed one hundred dollars; and the said corporation having appointed Drs. Holyoke, Lloyd, Tufts, Danforth, sen. Rand, sen. Fisher, Warren, sen. Waterhouse, and Dexter, to be a committee to propound the questions above-mentioned, and to carry into effect Mr. Boylston's benevolent purpose, they do hereby propose the following questions to all who cultivate medicine or the sciences connected with it, and invite their attention to a discussion of the several subjects here laid before them.

1. How does air act upon or influence animal bodies, in originating and continuing respiration, maintaining organic motion, and preserving the exercise of the vital functions?

2. What are the causes, the nature and cure of the autumnal diseases of infants, as prevailing in the New-England States?

3. Do any anatomical facts or discoveries explain the nature of tetanus or locked jaw? When the spasm arises from an injured nerve, in what way is the nerve affected? Or, does tetanus depend rather on the particular mode in which the wound is inflicted? And, if so, what is that state of the system most favourable to the production of tetanus?

Each thesis or dissertation on either of these subjects must be transmitted to Dr. E. A. Holyoke, of Salem, on or before the 20th of November, 1803, and with a sealed ticket or packet, with some device or sentence on the outside, and

within the writer's name and designation; the same device or sentence must be put on the dissertation it accompanies, and no dissertation can be received which has the writer's name affixed.

And this committee do engage to deliver, agreeably to said instrument, a gold medal, of the value of thirty dollars, or its value in money, at the option of the successful candidate.

All unsuccessful dissertations shall be returned, if desired, with the sealed packet or ticket unopened.

Signed by order of the committee,

E. A. HOLYOKE, *Chairman.*

Boston, Aug. 19, 1803.

MEDICAL COMMENCEMENT.

At a commencement in the University of Pennsylvania, held on Thursday, the 8th of June, 1803, the following gentlemen were admitted to the degree of Doctor of Medicine; having previously submitted their respective inaugural dissertations as they stand connected with their names, to the examination of the Provost, Trustees, and Medical Professors.

William Downey, of Maryland. An Investigation of the Properties of the *Sanguinaria Canadensis*, or *Puccoon.*

Robert Holmes, of Virginia. An Investigation of the Properties of the *Bignonia Catalpa.*

James Hutchinson, A. M. of Philadelphia. An Experimental Essay on the Conversion of Chyle into Blood.

Thomas Massie, of Virginia. An Experimental Inquiry into the Properties of the *Polygala Senega.*

John S. Mitchell, of Pennsylvania. An Essay on the *Arbutus Uva Ursi*, and *Pyrola Umbellata* and *Maculata* of Linnæus.

Garrett Elliott Pendergrast, of Natchez. A Physical and Topographical Sketch of the Mississippi Territory, Lower Louisiana, and a Part of West-Florida.

Franklin Scott, of Virginia. Experiments and Observations on the Means of counteracting the deleterious Effects of Opium, and on the Method of Cure of the Disease resulting therefrom.

Oliver H. Spencer, of New-Orleans. Experiments and Observations on Digestion.

Cosmo Gordon Stevenson, of Baltimore, Maryland. Observations on the Disease of Gonorrhœa.

John R. Young, of Maryland. An Experimental Inquiry into the Principles of Nutrition, and the Digestive Process.

John M. Walker, of Virginia. An Experimental Inquiry into the similarity in Virtue between the *Cornus Florida* and *Sericea*, and the *Cinchona Officinalis*, of Linnæus; together with an Inquiry into the Modus Operandi of astringent Vegetables in preventing the Putrefactive Fermentation.

Thomas Walmsley, of Pennsylvania. An Essay on Glandular Appetency, or the Absorption of Medicines.

Daniel Wilson, of Virginia. On the Morbid Effects of Opium upon the Human Body.

Henry Ashton. Subject of dissertation unknown.

Robert Carter. Subject of dissertation unknown.

Having seen most of these inaugural dissertations, we cannot but consider them as affording very honourable testimony of the diligence and abilities of the respective graduates, as well as reflecting great credit on the gentlemen who conduct the business of medical instruction in the University of Pennsylvania.

Among many others which deserve commendation, Dr. Young's dissertation on digestion is entitled to a distinguished place. He holds the prevailing doctrine, as settled by Spallanzani and others, concerning the solvent powers of the gastric fluid. He believes that all animals can be brought to digest vegetables, and may, by habit, be enabled to live on them; and hence, that animals naturally carnivorous may subsist on vegetables, and graminivorous on flesh. He rejects the agency of fermentation in the digestive process, and proves that the acid constantly found in the stomach during the progress of digestion is to be referred to the gastric fluid. He proves, likewise, that this acid found in the stomach is the phosphoric. He supposes aliment to be converted into chyle through the medium of a secretory operation, in the following manner: Aliment is dissolved by the gastric menstruum; it then passes into the duodenum, and meets with bile and pancreatic liquor; after being united with these, a heterogeneous mass is formed, called chyme, and from this the lacteals secrete chyle. By some well-devised experiments, he strongly confirms the doctrine of John Hunter, that the vital principle in animals is capable of resisting the action of the gastric fluid.

The dissertation by Dr. Walker also possesses an high degree of merit. Throughout the whole he displays diligent research, accurate discrimination, and a constant regard to objects of solid and practical utility.

After such proofs of the progress of these gentlemen in medical studies, we cannot omit expressing the pleasure we

feel at the prospect of the addition they will make to the corps of respectable practitioners in the United States. Nor can we avoid congratulating our country on the signal benefits conferred upon it by the medical school of Philadelphia, in annually educating so large a number of enlightened physicians, who are qualified to occupy the highest grades of reputation and usefulness in the profession. The learning, zeal and exertion of the Professors of Medicine in that institution do the highest honour to the western world. And we hazard nothing in asserting, that no medical seminary in Europe offers better means of instruction than are now to be found in the University of Pennsylvania.

LECTURES ON MEDICAL AND OPERATIVE SURGERY.

We feel great pleasure in announcing to the public an important extension of the system of instruction now presented to students of medicine at Philadelphia, by an annual course of lectures on Medical and Operative Surgery, delivered by PHILIP SYNG PHYSICK, M.D. of that city. This gentleman was long the favourite pupil of the celebrated John Hunter, and passed many years in the possession and diligent use of all the means of improvement which are to be found in the British metropolis. These lectures were commenced in February, 1801, in consequence of a request communicated to Dr. Physick, in an address drawn up for that purpose, and signed by a very large proportion of the students attending the medical lectures in the University of Pennsylvania. They are altogether of a practical nature. The eminent qualifications which Dr. Physick possesses for conducting this department of instruction, particularly his profound skill in anatomy and all the other auxiliary branches of knowledge, as well as his admired expertness as an operator, are so generally known in the United States as to render any encomiums from us entirely superfluous.

FOREIGN.

CHEMICAL AGENCY OF THE TWO ELECTRICITIES.

It may not be known to many of our readers, that, from a consideration of electric phenomena, especially those displayed by the Galvanic apparatus, Dr. Gibbes has been led to doubt the correctness of some important conclusions which form the basis of the chemical theory of Lavoisier.

The terms oxygen and hydrogen are, like some others used by naturalists, names applied to unknown causes of well known effects. If these terms were explained to stand for nothing more than a power existing somewhere of producing well defined effects (as the term Magnetism, *e. g.)*, Dr. Gibbes would not be found to differ from Mr. Lavoisier. He would only suggest to what known agents certain results might be attributed. Oxygen and postitive electricity might be convertible terms; but Mr. Lavoisier assumes the existence of two substances which cannot be exhibited to any of our senses, by way of explaining phenomena which are more simply explicable by reference to agents, the existence of which is demonstrable to our senses, and which are clearly adequate to the production of every effect.

Lavoisier attributes weight to oxygen, and calls it the ponderable basis of oxygen gas. Dr. Gibbes conceives himself warranted, by experiment, to say that oxygen gas is produced by the union of positive electricity with water; hydrogen gas by the union of negative electricity with water; and that water, uniting in different proportions with the two electricities, is the ponderable part of the elastic fluids. It is evident that the wire from the Galvanic pile or trough, which is found to be positively electrified, produces oxygen gas when immersed in water. The negative wire, in similar circumstances, produces hydrogen gas. By the positive electricity metals are oxydated—blue vegetable colours are reddened. The acidifying effect of electric commotions in the atmosphere on weak fermented liquors is well known. By the negative electricity the vegetable blue is restored—the oxydated metal revived.

These circumstances, among others, lead Dr. Gibbes to conclude, that when hydrogen gas is produced by the affusion of water on red-hot metal, and the metal is at the same time oxydated, a decomposition of fire, rather than of water, has taken place: that the hot metal has parted with negative electricity, which, uniting with a small proportion of the water, has formed hydrogen gas: that a greater proportion of water has united with the positive electricity, and entered as oxygen gas into combination with the metal. When the two gases are inflamed together, the spark attracts to itself, in due proportions, the two electricities contained in the two gases, which unite with explosion, and produce fire. The water with which they were before combined is of course deposited.

It is well known that each of the electricities repels its

like—each attracts its opposite. The two electricities are found to reside in almost all substances; perhaps blended in different proportions in all solids and liquids. It is, however, probable, that in uniform fluids the two electricities are almost or entirely distinct. Inflammable substances burn in oxygen gas, not in hydrogen gas: (at least not in the latter except under very peculiar circumstances. In Accum's Chemistry an experiment is mentioned, in which a mixture of sulphur and copper-filing was inflamed both in hydrogen gas and in carbonic acid gas). But the reason why, generally speaking, combustion may be effected in the former, and not in the latter, is, no doubt, owing to the prevalence of negative electricity in all inflammable substances. Thus, when a red-hot metal is oxydated by affusion of water, the quantity of hydrogen gas is enormously disproportionate to that of the oxygen gas which may be forced from the oxyd. Neither of the gases can be inflamed separately, because fire depends on the union of the two electricities; and such union cannot be effected unless both are present in due proportion.

The separate electricities appear to have some properties which they no longer possess in their united state. They constitute the permanent elasticity of the aëriform fluids, which are incompressible by cold, probably by a more perfect union with water than takes place between fire and water, when expanded as a liquid, or in the form of vapour.

I shall no farther anticipate Dr. Gibbes's developement of his theory, which he will no doubt illustrate by a due detail of experiments, showing, in regard to the principal phenomena of chemistry, that we have abundant evidence of the agency of the two electricities in the production of results attributed to the operation of the hypothetical oxygen and hydrogen; and that the action of the former is distinguishable in, and affords an easy solution of certain phenomena which the Lavoisierian principles can in no way be applied to explain. [*Lond. Month. Mag.*

Note.—In Dr. PHYSICK's communication, p. 36, after the words, "the ether evaporates, and leaves the gum in its original state," add the following, viz. *It must be observed, with respect to the ether, that if it be very pure, it unites with the elastic gum, and softens it very much, on which account I prefer the ether as it is commonly sold in the shops, and which is so weak that it will not unite with the gum, but extracts what remains of the spirit of turpentine very effectually. In this the elastic gum may remain about twelve hours.*